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THE MODERN SCHOOL OF THOUGHT ON THE PRACTICAL EFFECT OF CERTAIN UNSOUNDNESSES ON THE SERVICEABILITY OF RIDING HORSES*

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Papers confined to horses have been rather scarce during the last five years and to veterinary surgeons whose work is entirely confined to these animals the Annual Congress, therefore, has not made so much appeal as would otherwise have been the case. The last general paper on an equine subject was read in 1933 on "The Diseases and Accidents referable to the Hunting Field and Turf," and the opener of the discussion made some comment on the loose title and wide field of a paper of this kind. He submitted that papers on a specific subject would be more popular to members at the Annual Congress.

When I was asked to submit a paper the Provisional Committee requested that it should be a general subject and not one confined to any specific disease, and it is solely due to this fact, and not from choice, that this paper has been written.

I have endeavoured to confine myself, as far as possible, to conditions which in the last 20 years have particularly interested me. If my civilian colleagues do not see eye to eye with me on some points they must remember that it is not always possible to take the same outlook or deal with cases in civilian life in the same manner as in the Service, and that I am looking at unsoundness from a military standpoint.

The title of this paper suggests that many advances have been made in recent years in the part of Veterinary Science under review. Such is not the case, and for the most part the views held 20 years ago are still applicable at the present time.

Owing to the wide field of reference it has only been possible to touch the fringe of any particular disease, and I am aware that this paper does not bring out any new scientific facts, but I hope that it will at least provide food for useful discussion.

ROARING AND WHISTLING

Few diseases depreciate the value of a horse so rapidly, and their effect on a riding horse is always serious.

Little progress appears to have been made in recent years in lessening the prevalence of this condition and the numbers of riding horses rendered unserviceable each year must be enormous. In the Equitation School at Weedon alone, out of about 60 horses which are purchased annually, and a strength of roughly 200, the following figures show the numbers which have developed into roarers or whistlers in the last two years:—

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which works out at over 5 per cent. annually. These horses were mostly purchased at three years old and carefully examined for wind in each case before purchase.

The noise, however slight, generally increases and sooner or later will render the horse unfit for anything but slow work in nearly every case.

We still have to rely on either tubing or the roaring operation for the alleviation of this disease. The former is almost entirely confined to racehorses. It is not allowed in the army, and appears to have gone out of fashion in the hunting field, judging by the few tubed horses seen out nowadays.

THE EFFECT OF THE OPERATION FOR ROARING

The roaring operation is now almost universally adopted and has become more and more popular in recent years, but such varied reports are heard about the success or otherwise of the operation in regard to the horse's future utility that I will treat the subject in some detail, as I have kept records of about 300 cases.

The success of the operation, to my mind, depends on the following factors:—

(a) *Performance of Operation.*—Although nowadays it is treated as a minor operation it is nevertheless true that the percentage of recoveries varies with different operators. In my opinion the cleaner the lining of the ventricle is removed, the less the interference, and the

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more quickly the delicate structure of the larynx is dealt with, the better the wound will heal.

(b) *Early Operation.*—It is useless to expect a complete cure in old-standing cases. By this I mean horses which have been bad roarers for several years. It is possible that in these cases an improvement in performance may be noticed, but there will be little diminution in the noise. I believe this to be due to the fact that in old cases the cartilages have collapsed to some extent and no operation can bring about much improvement.

If cases are operated upon early, one should expect up to 70 to 80 per cent. complete cures. My rule is to operate as soon as one is certain that the horse is definitely a whistler or a roarer.

Critics will say, "Certain cases are only temporarily wrong in the wind and may recover by themselves." My reply is that no horse which is hard and fit will make other than a temporary noise unless it is a whistler, a roarer or an intermittent roarer.

It is well known that horses, especially young ones, when convalescing from any pharyngeal or laryngeal affection may not pass an examination for wind. These cases should naturally be left until they are fit and well, and the lining of the larynx has been allowed to get healthy. A decision can usually be arrived at in two or three months, and then the sooner the operation is performed the greater the chance of total recovery. If neglected, these cases are nearly certain to get worse, and to say the least, no harm is done by the operation. I know that in civilian life it would be difficult to persuade a client to permit an operation on a valuable five-year-old which is only a slight whistler, but I am convinced that early operation gives the best chance of a permanent cure.

(c) *Use of Local Anæsthetic for the Operation.*—I gave up using chloroform for the operation 20 years ago, and since then I have never had one death (except a broken back) that could be ascribed to the operation.

If a local anæsthetic is employed the dangers of pneumonia and catarrhal symptoms which sometimes appear when chloroform has been used, will never be encountered.

(d) *After-treatment.*—Do not tie up the horse after the operation. Put him in a loose-box and leave him there and, if he likes, let him eat off the ground. This will do no harm. I can never see any advantage in keeping the horse tied up, as there can be no more movement in the interior of the larynx to stop healing if he is allowed loose than if tied up. I allow horses a bran mash immediately following this operation.

I heard of one veterinary surgeon who lost two cases from pneumonia, both of which had been kept on pillar reins. He has had no more trouble since he gave them liberty at once. In one case I allowed a patient to be turned loose in a grass paddock immediately after operation and the wound healed in ten days.

(e) *Period of Convalescence.*—Too much time is generally given. Professor Reynolds stressed this point in his paper on this subject at last year's Congress.

Long convalescence adds to the expense of the operation, makes it less popular and is definitely harmful. The patient should be kept at work as far as possible, as tissues kept fit are more likely to remain healthy than those which have been allowed to become slack through rest.

My routine is:—

14th day.—Wound healed.
16th day.—Return to unit.
16th-28th day.—Walking exercise in hand, ten minutes at first and increase to 40 minutes.
28th day.—Start slow work and gradually get horse fit so that he can hunt six weeks after operation.

I can see no object in prolonged rest; if a case is not cured in eight weeks there is no hope for it.

(f) *Effect of the Operation* re *Grunting.*—The operation in itself does not always make a horse grunt, although this is not the generally accepted view. All it does is to change the nature of the grunt. Horses which grunt after the operation would have developed into grunters in any case.

A horse which grunts before the operation will grunt afterwards. I have three cases in mind at the present time which have been operated upon during the last two years and which do not grunt.

(g) *The Permanence of the Cure.*—Once a case is cured it should remain so indefinitely, and relapses are uncommon. A common view amongst laymen is that a horse operated on for wind may develop heart trouble. I do not believe this and see no reason for it.

I have also found that the operation is more successful in small or medium-sized horses than the big 15-stone horse, but can give no reason for this. It is often a fact, however, that a small horse may be slightly wrong in its wind and remain so, while in big horses the disease is invariably progressive.

Little has been written to account for the odd case which has definitely become worse as the result of the operation. It was suggested to me the other day that it might be due to accidental severance of one of the recurrent nerves when stripping the right ventricle. This appears to be quite a feasible explanation and

may account for those cases for which no other reason can be ascribed. In the Army at the present time a detailed record is being maintained of every case on which the operation has been performed up to the time the horse dies or is otherwise disposed of. It is hoped by this means to obtain an accurate record of the results, as up to date, owing to various difficulties, practically no reliable records have ever been published.

TONGUE SWALLOWING

I call it "tongue swallowing" for want of a better name. I can find no mention of this condition in Veterinary Literature, although it is well known in racing establishments.

A horse perfectly sound in the wind as far as roaring or whistling is concerned will, when severely galloped, suddenly make a loud gurgling noise in his throat which will bring him almost to a standstill. The noise ceases almost as soon as he is pulled up.

There is no tumour formation and on *post-mortem* all structures appear to be normal.

The effect is most serious in the case of racehorses, but less so in a hunter as the latter seldom gets sufficiently distressed to cause this symptom.

I have encountered three cases of this condition and its effect in each case rendered an otherwise good animal all right for hunting but useless for point-to-points.

Three possible causes are put forward:—

(i) An abnormally loose or large tongue which the horse attempts partially to swallow when distressed.

I do not believe this, as the noise still occurs with the tongue tied down.

(ii) An abnormally long or slackened soft palate—in one case I operated and removed a portion of the soft palate with no beneficial results.

(iii) Vibration of the soft palate and the horse endeavouring to take in air through its mouth.

I have mentioned this condition in the hope that some member may be able to shed more light on the subject than I myself am able to do.

GRUNTING

The effect of grunting by itself on the usefulness of a riding horse is nil, as the noise alone makes no difference to its utility.

Grunting, however, should always be looked on as a serious defect as it is so frequently the warning or accompanying symptom of subsequent roaring or whistling.

It is now generally understood:—

(*a*) That it is to be treated most seriously in a young unhandled animal. One that grunts at this stage seems invariably later on to go wrong in its wind.

(*b*) All grunters do not become roarers, neither are all whistlers or roarers grunters, although the majority are and *vice versa*.

(*c*) That one should look with far more suspicion on a young horse that grunts when suddenly "legged up" going over a jump than the horse that does it when threatened with the stick from the ground.

The connection between grunting and the roaring operation has already been mentioned.

The question of whether grunting by itself should be treated as an unsoundness is really not in the scope of this paper. It has, however, been a vexed question for years and it is generally shelved by leaving it as "a matter of opinion."

SPAVINS

Many factors enter into the case when deciding how far this disease affects a riding horse's utility. The principal ones are:—

(*a*) Is lameness present?

(*b*) Is there complete hock flexion?

If hock action is deficient owing to spavin, or lameness is present from this cause, a riding horse will in most cases become more and more useless as time goes on. Undoubtedly many horses lame from spavin do "warm up" to their work, but judging from any treatment of hock injuries, I am sure it is one of the most painful lamenesses and my sympathy goes with a horse which is worked under these conditions.

If no lameness is present and hock action is full the horse may continue to work for years, but, sooner or later, one generally finds lameness will commence.

Coarse hocks are another matter. Slight irregularity accompanied by proper flexion inside of the hocks of a seasoned hunter is far less likely ever to give any trouble than in the same on a three-year-old.

CURBS

Judging by the numbers of horses which are fired over the hocks, curbs do not appear to be so prevalent as formerly. This is possibly due to more care having been taken in breeding of late years.

At the present time at the Equitation School, Weedon, it is not possible to find a single horse with a curb, which, I am sure, would not have been the case 20 years ago.

Less notice is taken now of this condition than formerly and the effect of a small curb on a good-shaped hock is of small consequence, providing the horse is sound.

The same cannot be said of a curb on a sickle hock or one tied in below the joint. Such a curb is liable to cause recurring lameness after any severe riding or jumping work.

THOROUGHPINS OR BOG SPAVINS

These, if small, seldom cause any disability and most horses after several years' work, with much jumping, show signs of them in some small degree.

They are, however, undesirable if at all large and are likely to increase in size, especially in the case of horses used particularly for show jumping.

CORNS

Few diseases cause more annoyance in their effects and I know nothing more unpleasant than having to ride a horse previously free in action, which has lost that action owing to corns.

Corns are always liable to recur and the old saying "Once a corn, always a corn" is as true to-day as ever, in spite of the improvement in the standard of shoeing.

The generally accepted theory is that corns are confined to horses with flat feet and weak heels, but I have encountered just as much trouble with them in horses with good feet, well shod and with no pressure on the seat of the corn. It is frequently difficult to decide the real cause of this disease and I am convinced that factors other than pressure enter into it; otherwise, why is it so seldom encountered in hot climates where shoeing is of a much lower standard than in England?

NAVICULAR DISEASE

It is now universally admitted that in a true case of this disease, any cure is out of the question, and that any of the so-called cures were either palliative, or effected in cases of mistaken diagnosis.

The disease appears to be more frequently encountered nowadays in hunters than was formerly the case, perhaps owing to more definite methods of diagnosis, and it is also much more common in quite young horses than appeared to be the case in earlier days.

It is now quite a common event to meet cases in four- and five-year-old horses which have good open feet and which have not been put to any severe road work, and in which no history to account for the disease can be ascertained.

The disease renders a riding horse quite useless even in the early stages. A horse so affected is always liable to stumble and the fact that it is feeling its feet will not render it too safe over a country.

As a result, this condition is still, in its effects, one of the most serious with which we are called upon to deal, and once definitely diagnosed, a fatal termination must be looked for.

In the army during the last two years no less than 98 horses have been destroyed on this account.

Extensive research work has lately been carried on in connection with navicular disease by Major C. E. Oxspring, R.A.V.C., at the Royal Army Veterinary School and I understand that an article on the subject will, ultimately, be published in which it will be dealt with at length. He has, however, kindly furnished me with some of the conclusions which he has made up to date, and these are of such importance that I have no hesitation in including them verbatim:—

(1) Navicular disease can now be diagnosed by means of the X-ray in the very early stages, *i.e.*, long before many of the classical symptoms of alteration in shape of the foot, persistent pointing, etc., have appeared.

(2) Amongst the earliest manifestations of navicular disease is local decalcification of the bone and a radiological technique has been evolved which will demonstrate this. The interpretation is highly skilled and requires much practice.

(3) He has seen decalcification in a horse with only a history of lameness of ten days. The lameness persisted and became more pronounced, X-ray appearances from time to time showed a gradually advancing condition until after eight months. The horse was destroyed and on *post-mortem* examination an erosed cartilage with a carious patch in the bone was found.

(4) Where the case is at all advanced there is no difficulty in recognising it by X-ray with proper technique and he claims to be 100 per cent. correct in these cases over the last five years.

(5) Navicular disease is much more common than was imagined, and many cases diagnosed as other conditions have proved to be navicular disease. The classical shape of the foot described in this disease in the text-books is practically confined to the chronic or advanced cases of many months' or years' duration. It is rarely present in cases he gets now, because they are radiologically examined in the early stages.

The above conclusions are a great step forward and perhaps as a result of Major Oxspring's further work on this disease more knowledge as to its cause may come to light and prevention become possible.

Whether the early diagnosis will become universally adopted in civilian life will depend on the availability of X-ray facilities.

CATARACT

I do not believe this affects the utility of a riding horse so much as is generally believed.

There must be hundreds of hunters which are perfectly safe conveyances and have cataract to a smaller or greater extent, of the existence of which condition the owners are quite ignorant.

There are many instances in which small cataracts remain latent and do not interfere with the practical utility of a horse in any way.

I recently examined the eyes of over 200 horses of the Equitation School and found five to be affected with cataract, and yet not one of those in which it was detected had given the slightest warning of any eye trouble.

An interesting point which has come to my notice on several occasions is that a horse's sight is impaired to an extent that he will fall over jumps when the cataract is actually forming. He may continue to jump badly the whole of one hunting season, but once the cataract has formed, even if it is so complete as to cause total blindness in one eye, the horse may be a perfectly safe conveyance for several years following, provided the other eye remains sound.

A well-defined small lenticular cataract, although detracting from a horse's value, is always a good speculative purchase, especially if one happens to know of it having been in existence for any length of time without increasing in size. An Army horse which is one of the best show jumpers in England at the present time (and no more severe tests of good eyesight are required than to win the principal event at Olympia) has had a cataract for years.

I have noticed that when a horse starts to jump crooked or swerves at his jumps the reason can sometimes be ascribed to impaired eyesight. It will sometimes be found that if this swerving is not due to the more common cause, *i.e.*, a leg which the horse is trying to save, it will be due to some form of defective vision, and it will invariably be noticed that a horse will always shy or swerve towards the sound eye.

CRIB-BITING AND WIND-SUCKING

These conditions are still recognised in Veterinary Surgery as vices, although in the human subject wind-sucking is recognised as a definite nervous disease and is called Aerophagia.

Their effect will vary in individual cases. Some horses will maintain their condition and do their work without being affected in any way, whilst others will be predisposed to colic, loss of condition and indigestion.

The many ingenious methods of rendering it impossible for a horse to practise these vices are only palliative and the first opportunity of repeating the vice will be taken by the animal as soon as their use is discontinued.

Forssell's operation for the radical cure of the disease was carried out a few years ago by several veterinary surgeons more or less extensively. I myself performed it on 36 animals, and as far as I could ascertain, permanent cures were effected in 55 to 60 per cent. of these cases.

The operation, however, appears to be of too formidable a nature to warrant its general use and seems to have been discontinued in general practice and also in the Service.

SPRAINED TENDONS AND LIGAMENTS

I will confine my remarks to the effect of sprain of the flexor tendons and ligaments.

These injuries alone must account for more financial loss to owners of hunters and racehorses than all the other diseases put together and especially is this the case with steeplechase horses, judging by the fact that it is seldom one sees a field in the paddock of any but a first-class race without a large percentage having been fired.

All sprains of the flexor tendons, no matter how slight, are serious and one seldom gets complete resolution. They are almost always progressive and one practically never finds a severe sprain in one day without some signs of preliminary warning which have been neglected.

One still hears cases diagnosed as "sprain of the sheath of the flexor tendons." The sooner this term is given up the better, unless it be to diminish the extent of the injury in the eyes of the owner, as I have seldom been able to distinguish sprain of the sheath of the tendon, nor do I believe one exists without the other.

It is difficult to state which sprains are the most serious as they will vary in individual cases, but they are generally placed in the following order of severity: Subcarpal—Perforans—Suspensory—Perforatus.

In any case there seems no doubt about the first two being the most serious, but it is questionable which is the less serious of the last two.

It is remarkable how few flexor sprains occur in the Equitation School, Weedon, in spite of the amount of jumping which takes place with young horses. During the last two years there have only been nine cases, which goes to show that it is pace and not jumping which accounts for most sprains.

Much can be done in old-standing cases of sprain to keep a doubtful horse on its legs if care is taken in a few points of equitation, *i.e.*:—

(*a*) Teach a horse to lead with the sound leg. This is quite easy to do at all paces except really fast ones.

(*b*) Keep him collected as much as possible. The more collected the horse is the more strain is placed on the hind legs and correspondingly less on the fore.

(*c*) Work uphill takes strain off the flexors of the fore limb.

It should be much more easy than formerly to get these points in equitation carried out—judging by the advance in the standard of equitation in recent years in consequence of the formation of riding and pony clubs.

It is noticed that sprain of the suspensory is most likely to take place in hard going, whereas sticky and uneven going predisposes to sprain of the tendons.

The effect of sprain is less serious in a hunter than a racehorse and, providing the injury is not too severe—*i.e.*, there is no actual rupture—the case can generally be got sound enough for hunting.

One of the hardest things upon which to give an opinion is the chances of a fired leg standing work, and whoever does this is a brave man.

Just lately so-called "acid firing" seems to have come into use. Perhaps some Veterinary Surgeon can give some enlightenment as to its efficiency as I myself have never used it.

I have not mentioned the importance of conformation in this paper owing to lack of space, but it has so much bearing on the serviceability of a horse in relation to the wear of the back tendons that I feel I must briefly refer to it. One cannot help but notice that:—

(*a*) Horses tied in below the knee with small, round instead of flat bone, associated with small, mean tendons, are predisposed to sprain of the perforans and perforatus.

(*b*) A turned-in toe throws an extra strain on the outer branch of the suspensory ligament at the fetlock, with subsequent liability to sprain on work.

(*c*) Conversely, a turned-out toe leads to sprain and thickening of the inner branch of the ligament.

(*d*) Long pasterns predispose to suspensory sprain. This is especially noticeable in the hind limb, particularly if, in addition, it is associated with very straight hocks.

Although I am aware that many successful racehorses have some of the above defects in action or conformation, one cannot be too particular in the case of riding horses, especially those required for hunting or Army use.

If one wants tendons to wear, straight action and good bone must be insisted on, and it is to the high standard required in this respect when Army remounts are purchased in peace time that the small amount of trouble as regards sprained tendons in this class of animal at the present time is due.

Table showing the Prevalence of Some of the Diseases mentioned and their effects amongst Army Horses at the Present Time in the United Kingdom

	Disease.	No. of Cases.	Cast and Sold.	Destroyed.
April 1933 to March 1934	Navicular disease ...	78	1	60
	Spavin ...	127	–	35
	Curb	19	–	–
	Corns	100	–	–
	Sprained tendon	291	2	35
	Cataract ...	2	1	1
	Roaring ...	82	4	25
	Broken wind ...	65	2	54
	Ring-bone ...	136	1	34
	Side-bone ...	52	2	11
April 1934 to March 1935	Navicular disease ...	78	3	38
	Spavin ...	122	3	34
	Curb	19	–	–
	Corns	82	–	–
	Sprained tendon	257	5	19
	Cataract ...	4	–	–
	Roaring ...	83	–	19
	Broken wind ...	48	1	45
	Ring-bone ...	157	8	38
	Side-bone ...	40	1	6

The average strength on which the above figures are calculated is 1933-34: 12,992; 1934-35: 12,807.

. . . . .

Mr. J. Ewing Johnston, Belfast, President of the Veterinary Medicine and Surgery Section, presided over a well-attended meeting of the Veterinary Medicine and Surgery Section, when the above paper was discussed in the Physics Lecture Theatre, Queen's University, Belfast, at 9.30 a.m. on Wednesday, July 31st, 1935. The Chairman said he had much pleasure in calling on Major Townsend for any additions he had to make to his paper. Major Townsend replied that he had nothing to say at the moment.

Discussion

Mr. P. J. Howard (Ennis), the opener of the discussion, said:—

I will begin my remarks by congratulating the Executive Committee on having secured for this Congress at least one paper entirely devoted to the horse, and I must congratulate Major Townsend on the very excellent paper that he has presented.

I would also take this opportunity of thanking the Committee for the compliment they have paid me in inviting me to open this discussion.

Nowadays, when one is ever hearing of the passing of the horse and when one reads and hears of the frantic efforts by interested people to have that passing an accomplished fact, it is a pleasure to find even in the ranks of the

veterinary profession many who still take a keen interest in the horse.

The title of this paper would almost provide for a kind of Roving Commission of Enquiry, and it is certainly very instructive and most interesting to have a record of the experience of Major Townsend from the School of Equitation where reliable records of so many different horses are kept.

Time was when members of the veterinary profession had ample opportunity during their student days and in early life of gaining by actual contact that experience which helped them to become expert in the practical aspect of soundness. To-day that same opportunity is no longer there and it is certainly a very great handicap on the younger generation that many of them have little chance of ever gaining that expert knowledge in the school of experience.

The serviceability of the riding horse should embrace the pleasure, comfort and safety of the rider as well as the ability of the horse to perform well the riding work for which he is required; and here I would point out that the question of conformation will always be a deciding factor in the selection of horses for riding purposes, and the veterinary surgeon who has to give advice on the selection of riding horses must of necessity be a keen judge if his advice is going to be of any value.

As Major Townsend remarks, there is really very little if any change in the opinions obtaining to-day on unsoundness as compared with the opinions held 20 years ago. The whole question is still the same with one great and important difference—and that is that 20 years ago the majority of riding people knew something about horses and how to use them, and to get the best even out of one with an "If"; whereas to-day a very large percentage of riding people know little about horses and considerably less about how to use them, and this adds immensely to the difficulties of the veterinary adviser.

Major Townsend has given us his experience and opinions from the point of view of military service. I will try and give my impressions from the civilian aspect.

In considering these matters of unsoundness I would like to point out and to stress the fact, that there are two distinct schools of thought regarding the infirmities of riding horses.

It is a well-known fact that owners and people interested in horses for racing purposes, pay scant attention to soundness: and they will buy and at times pay fabulous prices for horses that are palpably unsound, provided they come from winning stock and that there is a reasonable hope of one day getting a head first past the post on a racecourse. This I think is unfortunate and materially affects the big advance that could and should be made in the standard of soundness in thoroughbred stock.

Against that, the people using horses for other forms of sport and riding, demand what I might describe as a highly exaggerated standard of soundness and thereby often miss a very desirable and valuable horse.

Wind: The first unsoundness to which Major Townsend refers is that ever-to-be controversial one of wind, and I endorse what he says, that nothing so much deteriorates the value of a riding horse as for it to be a whistler or a roarer. No man can recommend a young horse that is a whistler—the chances are, he is soon a roarer and as such, useless, unless for slow work. Of course there is the gamble of having him operated on, but it is a gamble.

The man or woman who can afford to hunt will not ride a *whistler* or *roarer*, but such horses might give years of useful service where they would be only asked to shake up the rider's liver at the trot.

Major Townsend has given a very useful dissertation on the roaring operation. This I will not discuss further than to say that I consider the operation absolutely essential and useful in many cases, and that, while I have seen good results, I have yet to meet a horse that has been operated on, which I would consider entitled to a certificate of soundness—and I would like to ask Major Townsend's opinion as to whether he would give a certificate of soundness to a horse that he knew had been operated on.

I was probably the first in Ireland to have the operation performed, when Professor, now Sir Frederick, Hobday kindly came over to give us a demonstration at Ballinasloe.

Grunting: As regards grunting, one may not take serious notice in the aged horse that is otherwise sound, but the young horse that grunts will to a certainty eventually become musically inclined, and the veterinary surgeon at an examination for soundness is bound to test for grunting and mention it, if present, in any report that he furnishes.

The affection referred to as *tongue swallowing* has nothing to do with the tongue. It is some cramp or spasm in the laryngo-pharyngeal region causing a gurgling noise and partly smothering the horse. I have seen several, and in two particular cases there was some form of heart disease. The trouble is not constant, it is intermittent—the horse does it one day and not the next. One could not recommend such a horse as a hunter or for fast work, though it might give years of good service at slower riding work.

All the infirmities that cause or may cause lameness in the riding horse are in the same category because a lame horse is really not fit for any class of riding work.

Spavin: The very word "spavin" has some kind of terror for the ordinary horseman. It is, I presume, because of the very severe and persistent lameness that sometimes is due to the presence of spavin. But the presence of a knob or bony deposit at the seat of spavin on a good big hock when there is true action and the horse is over five years old need not frighten one, and I have seen many such horses give years of useful service.

In the young unbroken horse one must take serious notice of the odd hock, as well as of true spavin, but as regards the so-called *coarse hocks*, if the hocks are well made and both perfectly alike and the action perfect, such hocks are always the very best and will never give trouble.

Curb: The importance of curb depends entirely on the conformation of the hock. With a well-shaped, good big hock a small curb is of little importance, but with an ill-shaped, small weak hock curb is a serious matter, though one at times sees some wonderful performers with hocks that are a curiosity to look at.

For some reason that is hard to explain a fashion has come about, that some very good judges make no objection to hocks that are fired for curb, while they would strongly object to the same hock that is not fired. Personally I fail to see what blessing the firing iron has conferred, but I do know that many horses are fired because of this fashion.

Thoroughpin and Bog Spavin: *Thoroughpin* and *bog spavin* in the aged horse may not be of importance and seldom cause lameness, but in the young horse they are undesirable and likely to be a source of trouble.

Corns: Corns are a very great source of annoyance and should not appear in good feet with careful shoeing, but there is a kind of foot with a low weak heel which is always liable to corns and should be avoided in the riding horse.

Navicular Disease: I do not know of any greater heartbreak than to have to decide that a good horse has navicular disease. It is just like a judge having to pass a life sentence on some unfortunate prisoner. Navicular is fatal to the riding horse and is unfortunately much more prevalent than people think. It is certainly more so in the thoroughbred and in my opinion would often account for a large percentage of the so-called "broken downs" of which one sees so many.

The radiograph will help in making an early positive diagnosis, though I think there are few forms of lameness about which one can be more definite. It is useful and economic in the army to have an early definite diagnosis, but the same will not apply in civilian conditions because owners cannot afford to destroy and they will try to get all they can out of such a horse.

When the disease is confined to one foot, as it may be for a long time, many good-couraged horses will give good performance when they have warmed up, but no lover of horses wants to see one trying to hobble out of his box in the morning.

I agree with Major Townsend that the so-called cures are a delusion. I am not surprised at the number of young horses affected, because I am convinced the disease is one of heredity and is not produced by any form or kind of work. I have observed the disease in animals that were never handled or trained and were practically never on the road. I have seen the four-year-old, her dam, G.D., and G. G. Dam on the one farm all affected. Here indeed the thoroughbred world might clean up its house and begin to knock on the head some of the cripples of mares than one sees in sale rings and in good paddocks.

In Ireland for many years the Department of Agriculture has done much and with very satisfactory results to eliminate the unsound mare from its horse-breeding schemes.

Cataract: Cataract is another hereditary infirmity and I would not care to recommend the purchase of a young horse so affected, but occasionally one does see a good performer with cataract in one eye. The trouble is that both eyes are eventually wrong. The growing or forming cataract causes more trouble than the fully formed and fixed one because the inflammatory process during formation upsets the sight still present in that eye.

Stable Vices: The so-called vices—*crib-biting* and *wind sucking*—destroy the value of a horse and no one wants to introduce such mischief-makers into his stable, though many such horses may give years of good service: but keep them separate from other good horses.

I would like ask Major Townsend if he puts "*weaving*" in the same category and what importance he attaches to it; personally, I think it makes a horse restless and tired.

Sprained Tendons and Ligaments: These are always serious matters in the riding horse. He would be a courageous man that would recommend a young horse with a doubtful tendon. One sees the condition more often in the race-horse and I think it is often secondary to some other trouble.

I have already referred to early navicular as a cause of broken-down tendons. Any slight lameness or soreness may result in sprained tendons, by the animal trying to save the sore limb, and once a tendon or ligament is sprained it will never be the same again. It must be a mysteriously keen sense of touch that can determine sprain of the sheath of a tendon and those veterinarians who possess that keen sense are to be envied.

The fact that one does not see very many cases in hunters or jumpers leads one to conclude that

pace is the real factor in causation. It is truly wonderful how such cases are patched up. There is still great faith in the "firing iron," but, as Major Townsend remarks, he is a brave man that will venture an opinion on a leg fired for tendon or ligament trouble. However, many such horses give years of service at slower riding work.

In his Supplementary List Major Townsend has noted the number of cases of ringbone and sidebone. I would like to ask him at about what ages those affections generally appeared, as I regard both as purely hereditary unless when ringbone is the result of split pastern. The horse with sidebone is a wooden ride and one would never recommend a young horse so affected for a riding job.

Perhaps Major Townsend would tell us, also, if they have many cases of stringhalt and shivering and if many of their horses develop signs of heart disease. My experience is that stringhalt and shivering are not as much in evidence as they used to be. One sees an occasional case of heart disease and I think heart affection accounts for some of the blunders that riding horses make at times.

I have tried to give you my impressions from the civilian aspect; I know I have not gone very deeply into any of the infirmities mentioned, nor have I been able to contribute any new information. I am delighted to have had the record of Major Townsend's experience, which to me is very instructive.

I again thank him for his paper and I sincerely hope there are many members ready to give us their views and that we will ever continue to take a keen interest in man's noblest friend the horse, which has helped to make the veterinary profession, and which must be always our most valuable concern. (Applause.)

The Chairman said he would like to congratulate Major Townsend on his paper, also Mr. Howard for his splendid opening. There was any amount of food for thought there and he hoped the members present would not be backward in coming down and giving that paper a good discussion, as it deserved. (Applause.)

Professor J. G. Wright (London), said that Major Townsend's paper had definitely shown that the commonest cause of permanent unsoundness in riding horses—at any rate in the Army horse—was navicular disease.

What modern advance had been made on that subject? As far as one could see, advance made lay entirely in the province of diagnosis. Major Townsend's colleagues, Major Oxspring and Colonel Pryer, had shown, quite definitely, that the disease could be accurately diagnosed quite early by radiography, and as the result of this it had been found that the symptoms were rather different from those of the accepted teaching. They had shown that the onset of lameness was not always slow and insidious, it might be quite sudden and definite, and that in such a case it was possible to demonstrate changes in the bone by radiography. At the same time considerable technical skill was required to demonstrate these changes with certainty, particularly bone caries.

A point he had been impressed by was the great frequency with which one found osteophytic outgrowths along the postero-superior margins of the bone. In a series of diseased navicular bones possessed by the Royal Veterinary College, collected by the late Captain Russell of Grantham, osteophytic changes of this nature were present in 90 per cent. of cases. Colonel Pryer drew attention to the "spur" formation at the upper extremities of the bone, some years ago. He (Professor Wright) had found that there was a greater tendency to new bony outgrowth about the centre of the postero-superior margin, and that this was the position to which great attention should be paid when studying a radiograph.

The other advance in diagnosis was the establishment of positive foot lameness by plantar block. As radiography was still a luxury as far as most of their equine patients were concerned, he would submit that in all cases of fore leg lameness, other than the most obvious, plantar block should be adopted as an aid to diagnosis.

They—the younger men—had not the experience of the older practitioners in the diagnosis of lameness. They had been told of differences in action whereby they might differentiate foot lameness, from—for example—shoulder lameness, and yet when they met cases in which they thought this latter action was typical, upon checking themselves by adopting plantar block, they found, to their amazement, that it was still in the foot.

They met many cases of lameness in the lighter breeds which were sudden in onset. It was positively in the foot. Examination revealed no discernible changes in the foot. The case was not one of laminitis, gathered nail or corn, nor were the feet blocky and upright, or the heels contracted. If as the result of several months rest such an animal did not go sound, one was forced to the conclusion that the case was one of so-called navicular disease.

The main problem, however, which concerned them—and he commended its study very seriously to Major Townsend and his colleagues—was the cause of the condition. He saw that they had Professor Mitchell of Edinburgh there with them, and nobody had done more in the serious study of these conditions in the horse than he. (Applause.) The old teaching had been that "hammer, hammer, hammer on the hard, high road," was the exciting cause, whilst the predisposing cause was probably hereditary. And yet, there was no evidence to show that it followed genetic factors. By saying that it was a predisposing cause, they were floundering in obscurity.

Modern views had been expressed that these conditions were toxic in origin; that they were the result of dietetic deficiences, mineral or vitamin. He would ask Major Townsend if he had noticed whether or not this disease, and another that was under discussion—whistling and roaring—was more common after an outbreak of one of the acute infectious diseases such as strangles.

Research into these diseases of the horse would not only be a very difficult matter, but a very expensive one; nevertheless, at the same time, sound clinical observation might do much to help in the solution. The subject of feeding

milch cattle had received considerable attention from the dieticians and hygienists. The question of feeding horses had received little attention, particularly from the aspect of the mineral and vitamin content of the diet. He submitted this subject to the interest of their Army friends.

Another point upon which he would like to make a few short remarks was local anæsthesia. He entirely agreed with Major Townsend's views. They had had a striking demonstration of the efficacy of local anæsthesia yesterday (Professor Wright was referring to the operation performed by Professor Frost of Cornell). One heard many questions as to the nature of the anæsthetic used. Was it cocaine, novocain, chlorocain, etc.? It was time that confusion regarding the names of local anæsthetics was cleared up. The Germans introduced years ago, a synthetic substitute for cocaine under the name of novocain. Chemically it was designated ethocaine hydrochloride. Practically every large pharmaceutical concern marketed the same or a very similar preparation, under a proprietary name of its own, and this had caused the confusion. The drug, however, was now included in the 1932 British Pharmacopœia under the name procaine hydrochloride, and he thought that this was the name to which they should confine themselves. Again, another point to which he thought attention should be drawn, was the strength in which this agent should be used. He had recently seen an article in which it was suspected that a puppy had been poisoned by using a proprietary solution of the agent. The solution in question was a 5 per cent. one. Why use a 5 per cent. solution when a 1 to 2 per cent. sufficed for subcutaneous infiltration? For perineural infiltration such as plantar block in the horse he used a 5 per cent. solution. For subcutaneous infiltration, particularly in small animals, a 1 to 2 per cent. solution was ample.

Professor W. M. Mitchell (Edinburgh) next spoke. He said if they condensed the contents of the paper, it came down to being one on prognosis, and if they looked through veterinary literature where would they find a book on prognosis? There was not the slightest doubt that if a practitioner, away back in the years when horses were the chief means of transport, had written a book on prognosis the present generation would have been very grateful. The highest form of clinical work was founded upon prognosis. When one looked back on the time one started to teach, one wondered how one had the audacity to try and instruct students on prognosis with so little experience to serve as a guide. Reading through that paper, one saw that it was founded on experience and therefore he wished to congratulate Major Townsend for putting forward that paper largely on prognosis.

To be able, however, to give a sound prognosis they must be sure of their diagnosis of a disease and understand its cause and he thought it was due to mistaken beliefs on these points that there was so much confusion of opinion regarding these various unsoundnesses of the horse.

To his mind, the following conditions dealt with in the paper—roaring, whistling, spavins, corns, navicular disease, cataract—were all local manifestations of one general disease, because if a careful *post-mortem* examination were made of animals so affected there would be found widespread lesions of an inflammatory nature throughout the body and not merely the change of the particular region which produced the clinical or local manifestation.

Probably the commonest system to be affected in the horse was the nervous system, even in horses where there was no clinical manifestation of nerve derangement. It was in peripheral nerves that he had seen nerve degeneration, in such nerves as the sciatic, femoral, radial, median and recurrent laryngeal, but what degree of damage determined the border line between the absence or presence of clinical nervous signs he did not know. Other common lesions apart from bones and joints were ulceration of the œsophageal part of the gastric mucous membrane and hypertrophy of the terminal portion of the œsophagus. With such a widespread disease process of an inflammatory nature he felt that there must be some causal factor or factors of importance other than the time-honoured one—heredity. Personally, he would not like to deny altogether the importance of heredity, though he did not think that the study of heredity was going to carry them very far. His impression was—at any rate as far as the heavy horse was concerned—that the various Horse Breeding Acts had done little to diminish the unsoundnesses of the horse. (Applause.) The lesions as seen in nerves, bones and joints were all of an inflammatory nature and appeared to him to be due to some unknown irritant factor acting through the circulation on terminal blood vessels, thus altering the nutrition of the parts.

Five or six years ago he had raised the question of whether vitamin deficiency had something to do with the frequency with which they got these diseases north of the England border, and he wanted to read a short note from his colleague Professor Linton—who, by the way, wished to express his regret for not being able to be present himself—to show what they were attempting in Edinburgh.

He would read the note as Professor Linton had given it to him, which was only roughly drafted at the time to be used as notes.

At this point, Professor Mitchell proceeded to read the following contribution to the discussion received from Professor R. G. Linton (Edinburgh):—

"At Professor Mitchell's request, I have been collaborating with him in his investigation in the nutritional study of this very difficult and extremely interesting problem. My assistant, Mr. Arthur Wilson and I have been investigating some aspects of the mineral supply in horses' dietary and also the vitamin A reserves carried in the livers of horses. While a preliminary report on the investigation may be published shortly, we think that the results so far obtained are of sufficient interest to be placed before the members of this Congress.

"I am suggesting that an herbivorous animal kept under natural conditions would carry a reserve of vitamin A in the liver equivalent to not less than 1,000 B.U. per gramme (Moore's units). Healthy sheep carry 1,000 or more. Of 78 horses' livers from which we have made assays recently, we found 37 per cent. to contain less than 100 B.U. per gramme—in some cases merely a trace; 13 per cent. less than 200; 28 per cent. less than 500; while only 6 per cent. contained 1,000 or more. From the work of Dann and others it is known that a healthy new-born fœtus borne by a healthy mother will carry very much less vitamin A in its liver with which to start its life than is present in the liver of its dam. The initial store in the liver of the fœtus is governed to a certain extent by the reserves in the liver of the dam. It follows, therefore, that if the pregnant mare has a very low liver reserve, the fœtus will be handicapped not only

at and after birth but during intra-uterine development. While the livers of properly nourished new-born animals should carry a supply of vitamin A, the principal source of vitamin A for the new-born animal is in the colostrum of its mother. The colostrum of healthy, properly fed animals contains a rich supply of vitamin A which gradually lessens as the character of the milk loses its colostral nature. It follows, therefore, that if the dam has neither a vitamin A reserve in its liver nor an adequate vitamin A supply in its colostrum, the foal cannot get a supply until such time as it commences to eat grass.

"We do not claim that the work we have done up to present is anything more than suggestive but we intend to continue this investigation during the next breeding season, studying the reserves of foals and also the vitamin A content in the colostrum of mares."

Continuing, Professor Mitchell said whether a deficiency of vitamin A in the dietary of the horse was one of the factors behind so much open and hidden disease was not yet decided but it might well be the predisposing factor accounting for the many conditions he had previously tried to link up, from the foal *in utero* to the aged horse.

The question of mineral imbalance, particularly of the Ca: P ratio, had not yet been closely studied in this country as far as disease in horses was concerned and this problem was also being investigated by his colleague Professor Linton.

By the study of such factors of nutrition one hoped for advance in the prevention of the far too common unsoundnesses of the horse.

There was one thing about which he wished to commiserate with Major Townsend in his statistical enquiry and that was that he was dealing solely with horses from four years old upwards. The study of most of the unsoundnesses required investigation at the beginnings of disease and for this the best place appeared to him to be in breeding areas where mares and foals were to be found. (Applause.)

In conclusion Professor Mitchell said that he considered the tendency towards a State Veterinary Service a catastrophe not only for the profession but also for the farming community, as the study and supervision of diseases with no apparent Public Health value would suffer.

Mr. Brennan DeVine (Birmingham), stated that he had not much to say, but he had heard something in the discussion that aroused his interest. In speaking of roaring, the laryngeal operation was only a gamble; 60 or 70 per cent. of the horses were cured, and became serviceable afterwards.

He would like to repeat the question as to whether or not one was to pass a horse sound that had been operated on. He had had several cases put in front of him, especially where there had been difference of opinion, for wind, and one or two cases where he knew the horses had been operated on. Without the history and knowledge of those horses he would pass them, but he would like to get the matter definitely settled as to whether he should pass them or not and give a certificate of soundness.

In respect of the serviceability of horses, Major Townsend had told them about racehorses—they did not care whether they were sound or not, and it was coming to hunters' notice. He (the speaker) usually had a hunter—perhaps two—for sale; he tried to make his hunting as cheap as possible, and when he "made" a perfect horse he tried to sell him after a couple of years' hunting. He was asked how many point-to-points the horse had done. The hunting people nowadays wanted a point-to-pointer, and a lot of the hunting horses were being spoiled because fellows wanted speed to win a tin cup, whereas the riding horses did not go in for swiftness; and he depended on that rather than that a horse could gallop 3¾ miles, and the owner get a pot on which to put his name for his grandchildren to see. He had given up point-to-point riding 20 years ago, but in order to sell his horses he had to risk his life occasionally in point-to-point races. He would rather see them come back to soundness. He bought a fairish number of horses, and he bought them with rough hocks. When he took those horses home they told him in his town he had got a spavined horse. He had now six or seven horses with very rough hocks, but he did not call them spavins. He liked good big joints. He had got good service out of them.

They had heard some revolutionary ideas that morning, and he dared say that what he was going to state might sound revolutionary to many of the practitioners there—that was, that he was not in favour of the firing of curbs. The only thing that firing had done was to convince many people who considered themselves horsemen to put something on the horse to prevent its being lame. When he was a young practitioner he used to go in a great deal for firing. Firing he considered should not be done by any scientific person at the present time. Firing was like some other practices carried out, which he was not going into at the moment.

As regards navicular disease, it was a curious thing that they got so many corns among horses here and not in countries where the shoeing was bad. In Egypt at the present day they had got a type of shoeing which had been carried out there for a thousand years. They had the same thing in Morocco, but slightly different-shaped shoes. That type of shoeing was a type that had been condemned in this country. When they got a horse treading on the ground, the sole and heel and everything else came in contact with the ground. The speaker then proceeded to illustrate on the blackboard the type of shoe used in Egypt, and stated that in the horses so shod one very rarely found a corn. The shoe in use in Morocco caused the pressure to fall on the sole of the foot, whereas in this country the pressure was on the outside of the foot, and the inside was bare. As a matter of fact, the English form of shoe caused the inside parts of the foot to become idle and degenerate, and he thought that was the cause of the corn.

One had to admire and respect Professor Mitchell's opinion on anything, he was so thorough in his work, but he was sorry to hear Professor Mitchell say that he did not agree about heredity being considered in the sickness of horses. Personally, he thought the horsebreeding schemes had done much to produce sound horses.

As regards sprained tendons, he thought the majority were due to gallop and hard work.

In connection with heredity, the speaker told of buying a dapple grey horse in a certain neighbourhood. The following year he went into the same neighbourhood, and within two or three miles of the former place bought another horse, by the same sire. The next year, he bought a third horse. All were by the same sire, not from the same farm, but in the same district. Each horse developed stringhalt after a year or two. He thought that was a very good example of

the part that heredity played. The trouble might have been due to some vitamin or mineral deficiency in that particular area, but the heredity idea was very strongly impressed upon him.

He would like to mention another point—and it was in the hope of offering helpful criticism. Professor Wright had spoken of the great amount of attention given to the dietetics of cattle in comparison with the horse. He took the greatest exception to that, because he knew something about dietetics in horses. In 1880 Samuel Hunting had introduced a German method of feeding into the North of England. His method was to crush corn and other grain and mix them in certain proportions with chopped hay and feed the animals in that form. He also gave them barley, maize, hay, and clover. He had developed dietetics in connection with horses long before it had ever been thought of by others in this country, and that idea had been developed later by his son-in-law and by one of his former assistants; and by the work of those men a great deal had been done on the dietetics of horses. He thought if Professor Wright investigated the matter he would find that dietetics in connection with horses had preceded that of cattle, sheep and pigs. He would like to pay tribute to the men who started that work in this country, including the father of the late well-known William Hunting.

Another question that Professor Wright had mentioned was that of anæsthetics, and the chemist selling the preparation under his own nomenclature. They should all go back to the pharmaceutical name. It was a pity they had adopted the method of using proprietary drugs and not knowing what was in them. (Applause.) He was afraid the practice was extending, and he would not be so discourteous as to mention the country in which it was most common.

Professor Dr. Frost (U.S.A.) (who was greeted with applause), said that a gentleman that morning had spoken about that being one of the few papers on the horse and horse troubles, and it made him think he was at home. At home, if they got one paper on the horse they did well, for they seemed to overlook such a thing as a horse. He must admit that he did not expect to speak, and he had not read that article too carefully. He thought there were a good many ideas for thought in that paper and the discussion as it had gone on. Some of those naturally he did not agree with, for no two people agreed on all things.

For instance, Professor Mitchell had mentioned roaring as being caused by the same thing as caused bone diseases. He did not think that was always true. It might be in some cases, he would admit, but they had evidence that several of those cases of roaring were not due to nutritional disturbances. For example, he could think now of one stable in which they had eleven mules that developed roaring. Without a question that was due to the feeding: it developed too rapidly to be a nutritional disturbance. Nevertheless, in certain cases, roaring probably had something to do with nutrition in its broader sense.

They got quite a few horses that developed goitre, and he had found such not good subjects for operation. Ordinarily, they did not operate on him while he had it. They cured the goitre first, and after the goitre had disappeared they operated. What connection there was he did not know: it might be in the nature of nutrition, if they called goitre a nutritional disturbance and they were led to believe it was something of that nature, because they had what they called a goitre area. Through the State he happened to live in, which was away from the sea, a very large percentage of the girls at the age of puberty developed goitre, while the boys did not. Why that was so he did not know. This had gone on to such an extent that iodine had been introduced into the schools, some even being put in drinking water. His own daughter had developed a small goitre. He took her to a friend of his, a goitre specialist, who told him that if she were his daughter he would give her iodised salt. He would not be surprised if there was something in the nature of nutritional disturbance or deficiency as a cause of roaring.

In the United States there was a sort of mania for doing roaring operations. It was good money, he supposed, but he had to admit that, as a result of it, they had some poor results: the operation had got a bad name, in some cases, for that reason. They might say, but what are your results? One physician—who was not a rapid operator, but rather slow—said it was not the length of time it took you to operate, or by what method, but he always liked to be able to look at his patient when going down the street, and not be ashamed to meet him. It was the results that counted. Trying to get the money had led people into doing the operation rather carelessly, with the result that the percentage of cures had not been what it might have been. In the heavy draft horse he had come to the conclusion that it was important to remove the cartilage from the upper edge of the ventricle if one wanted the horse to be absolutely sound.

There were those cases mentioned in the paper —the advanced cases—where paralysis of the arytenoid cartilage was complete; in those cases it was difficult to get a complete recovery. That animal did not make a noise, perhaps, but it did not breath properly, because it was difficult to bring the arytenoid cartilage back to its normal position. At one time they used to take away quite a large portion of the vocal cord, but he thought that was a mistake, as, in his opinion it did not make much difference.

With regard to pathological processes within the foot, he was of the opinion that they were the result of lack of movement and of contraction in the posterior part of the foot. To correct corns, they put on what they called a posterior bar shoe. Instead of turning forward, it was turned back. He took the ordinary shoe and reversed it—took the toe for the heel and brought it together and produced a posterior bar shoe, which anybody who could pound iron could do. They used that shoe a great deal. They also used it in navicular disease, because it did not increase lameness by pressure on the navicular bone. He had been interested in that subject of navicular disease a good many years. He did not think they knew much about it. In his view, navicular disease and spavins were all the same thing, to be honest about it. He did not think that it was at all hereditary—that was not because he was running with Mitchell. They saw such a big percentage of animals having one of those bone diseases after another, which might be hereditary, but they got so many of those diseases showing up at the end of their winter season. That was in the case of a horse that had been confined practically six months of the year, getting no sunlight. The farmer's horse was confined in the stable from November till the first of May, which was a serious thing, particularly with their young horses. They did

not see those animals showing trouble during the summer months; it commenced in spring. Taking the young colt, he put rickets in the same category as spavins and ring-bone. They got a great deal of rickets. They showed up about the sixth or twelfth month, because the colt was confined then. In May or June it was just ready to go into stable. They did not get any exercise ordinarily, because the winter was too severe, and they were fed on dry hay and bran. Before spring, a lot of those colts began to show evidence of rickets, and some of them had developed not only rickets but some other disease, and later on they had ring-bones, and spavins, and so on.

When he used the word nutrition, he did not mean necessarily that the animal was not getting enough calcium, or phosphorus, etc.—he thought it was a much broader term. They had to consider diet, what part variety played in the absorption of food substances, and the part sunlight and vitamins played. Those were all parts of nutrition, to his mind. There was one illustration of that in connection with one stable he had been interested in. The horses were bought here, there, and everywhere. They were sound, heavy horses, used only at night, from about 9 till 4 in the morning, just as it was breaking day. So they did not see any sunlight. In the daytime they were kept in the stable. The average life of the horse kept in the stable was about three years. They all developed evidence of bone disease in some form or other. More recently they tried having the horses put out and tied up in the sunlight. Then they developed the idea of getting them green food, which it was rather difficult to do. They also increased the amount of minerals in their food, with the result that they had been able to keep those horses going much longer than when they developed those bone diseases, which were evidence of nutritional trouble.

Reverting to navicular disease, he wondered what caused the lameness: he was not satisfied that irritation of the navicular bone was the actual cause. They bought up for their students about 50 old horses, and dissection of the feet revealed the fact that a big percentage had navicular disease, yet those horses were not lame: many of them never had been lame. There was a big percentage of heavy horses, and some people thought that heavy horses did not have navicular disease. He knew that a good many of those horses went on and made serviceable animals, and would pass an examination for soundness.

The Reply

Major C. H. S. Townsend (Weedon), in his reply, said he would like to thank Mr. Howard for opening the discussion on his paper, and for letting him off so lightly. Fortunately for him, there were not many questions which he was called upon to answer, so as the time was getting on he would be very brief.

Mr. Howard had referred to the roaring operation as a gamble. That was one point which he had tried to stress in his paper, that in a suitable case it should not be called a gamble. If one operated on a horse when he was first developing roaring—say a four- or five-year-old horse—that horse was probably just whistling. He was getting worse every day. In two months' time one knew that the chances were that horse was going to develop into a permanent roarer. If they operated on him at that time, and did not leave him, he did not think they need treat the operation as a gamble, and he thought they could get a more permanent cure in a large percentage of cases. Why the operation was coming into disrepute was the fact that the horses were left too long before the operation was attempted. Of course one always had difficulty in persuading a client to have the operation, because he thought the horse might get right again without it.

Both Major DeVine and Mr. Howard had asked him how he would refer to a horse that had been operated upon when the question came of writing out a certificate for it. He considered that a very debatable point, but the fact that the horse had been more or less mutilated would not allow one to write out a clean certificate without mentioning the fact; nevertheless he thought that one would be perfectly justified in saying that the horse had been operated on, and one considered that for all practical purposes the horse was sound. He knew of one veterinary surgeon at the present time in England who examined a tremendous number of horses. That veterinary surgeon was known to be one who gave horses a very severe test for their wind, and he was shown one or two horses which he had passed and which were found subsequently to have been operated upon. He informed him the other day that in practically any case in which he was in any doubt at all he now always shaved the skin over the site of the operation at the time of examination.

Mr. Howard had asked him what he considered was the effect of weaving on a horse. Fortunately, in the Army they did not seem to get a tremendous lot of weaving at the present time, but he did not think there was any doubt that weaving had the effect of producing undue wear and tear of a horse's front legs. Also, it had a nervous effect on a horse, and one found that a horse which was a weaver was generally a difficult horse to keep in condition.

In reply to Professor Wright, who mentioned that one should use plantar nerve blocking in diagnosis, it was a thing which he had done for years, and in practically every lame case in which he was not at all sure, he injected the plantar nerves. It was done very frequently in the Army at the present time, but there was one point on which he disagreed with Professor Wright. Professor Wright had said since using that method to detect lameness he had discovered that a lot of his shoulder lameness had turned out to be lameness in the foot. His experience had been rather the opposite, and he had discovered many cases which he thought were foot lamenesses which had turned out to be wrong in the shoulder. He knew it was against most people's convictions, but he was sure there was more shoulder lameness—especially among jumping and riding horses—than was thought to be the case.

Professor Wright had also asked him if he thought that navicular disease or roaring might be of toxic origin, or due to the outcome of febrile diseases. As regards navicular disease, he had only the Army statistics to go on, and if one referred to those statistics for the last nine or ten years they would find that the number of horses destroyed for navicular disease had been more or less the same each year. In one or two particular years they had had in the Army outbreaks of influenza, and if that had had any effect on the amount of navicular disease he thought it would have been shown in the

statistics. He was convinced that those diseases did have a tremendous effect on the amount of roaring one got. At the Equitation School two years ago he had had an outbreak of influenza in a mild form but in which 90 per cent. of the horses were involved, and in that year the amount of roaring which had subsequently developed was three times as much as in any normal year.

He did not know if he was in order, but he thought it would be a pity to let Professor Frost, who so kindly did the operation for them the previous day, go off to America without asking him one question concerning it. He understood him to say that he was able to diagnose roaring by feeling the larynx from the outside. If that was the case it was a tremendous step, and he felt sure they would all like him to illustrate that point, so that they could all hear him.

There was one other point as regards his operation, and that was the amount of the ventricle which he took out, or rather the amount of the lining of the ventricle. On the right side, which was the first one Professor Frost removed, he took out about ¾ inch, and on the left side about ½ inch. They in England had always been taught that if one was to get successful healing and the vocal cord drawn back, the complete lining of the ventricle must be removed, and it must not be torn. Perhaps Professor Frost would inform him if that was his experience or not, because if it was not necessary to remove the whole of the ventricle—or rather the lining of the ventricle—it would simplify the operation a lot, because one would be less likely to do any damage to the cartilage. (Applause.)

The Chairman: Professor Frost, if you are very brief, we would be glad if you would answer that question.

Professor Frost said that, with regard to the diagnosis of roaring by palpation on the side of the neck, the hand was laid flat against the side of the larynx and passed along the side of the thyroid cartilage until it came to the upper edge. If they put their finger between the thyroid and arytenoid, they would feel a depression at that point in a case of roaring. If they compared that with the right side he did not think they would have any difficulty in feeling it.

With regard to the removal of the mucous membrane, he had taken out that on the left first. He did not remove so much of the lining of the ventricle on the right side as on the left. That did not mean that he did not strip the right ventricle just as far as the left: he loosened it just as much, but he did not take as much off. If the mucous membrane was stripped, he did not think it was so important to cut it off. In experimental cases he had not cut it off, and the horses got well, so he would not advise that.

SHEEP THE SIZE OF BUFFALO

The Nairobi correspondent of *The Times*, in a recent message, states that many interesting remains have been discovered by the fourth East African Archæological Expedition under Dr. L. S. B. Leakey. Excavations in Oldaway Gorge produced a number of new animal species, including an almost complete skull of a new genus of sheep, the size of a buffalo and with a 6 ft. horn span. North of Lake Eyassi fossil beds, earlier than those of the Oldaway Gorge, were found, together with the remains of a primitive mastodon.

Clinical Communication

AXIAL FRACTURE IN A RACEHORSE

W. L. COCKBURN, M.R.C.V.S.
Liverpool

I forward, as likely to be of some interest to the profession, an X-ray photograph showing the Axial fracture in the case of the racehorse "Henri's Choice," which fell in the Liverpool Hurdle Race on March 30th, 1935.

The Odontoid process is broken and doubled downwards, making with the under outline of the remainder of the Axis an angle of 70 degrees instead of being almost straight.

POISONING FROM *B. ÆRTRYCKE* IN MEAT

It was stated at a recent inquest on a Poplar married couple that they died after eating a meal of meat and vegetables, and Dr. Hewlett said that he found the *Bacillus ærtrycke* in the organs of both of them.

"It does not affect the taste or the smell of the meat," observed Dr. Hewlett, "and people do not know that the meat has gone bad. The meat had probably become infected during the life of the animal. It is just possible, however, that it became contaminated by flies. Thorough cooking destroys the organism." He added that this germ was probably the commonest of the organisms which caused food poisoning. It was very common in animals, occurring in cattle and also in rats and mice. Its distribution was fairly wide.

Dr. Frank Shiel, assistant medical officer for the district, said that all the meat had been eaten and it could not be determined where it was bought. It was very probable that the cold meat was poisoned. Another family had been suffering from food poisoning caused by the same germ found in fish, but they were not seriously ill.

The Coroner said it seemed to him that if the whole carcase of the animal had been poisoned there would have been other cases. He thought that the meat had become infected after being bought and between the time it was cooked and eaten.

The jury found that the deaths were due to food poisoning, and returned a verdict of "Accidental death" in each case.

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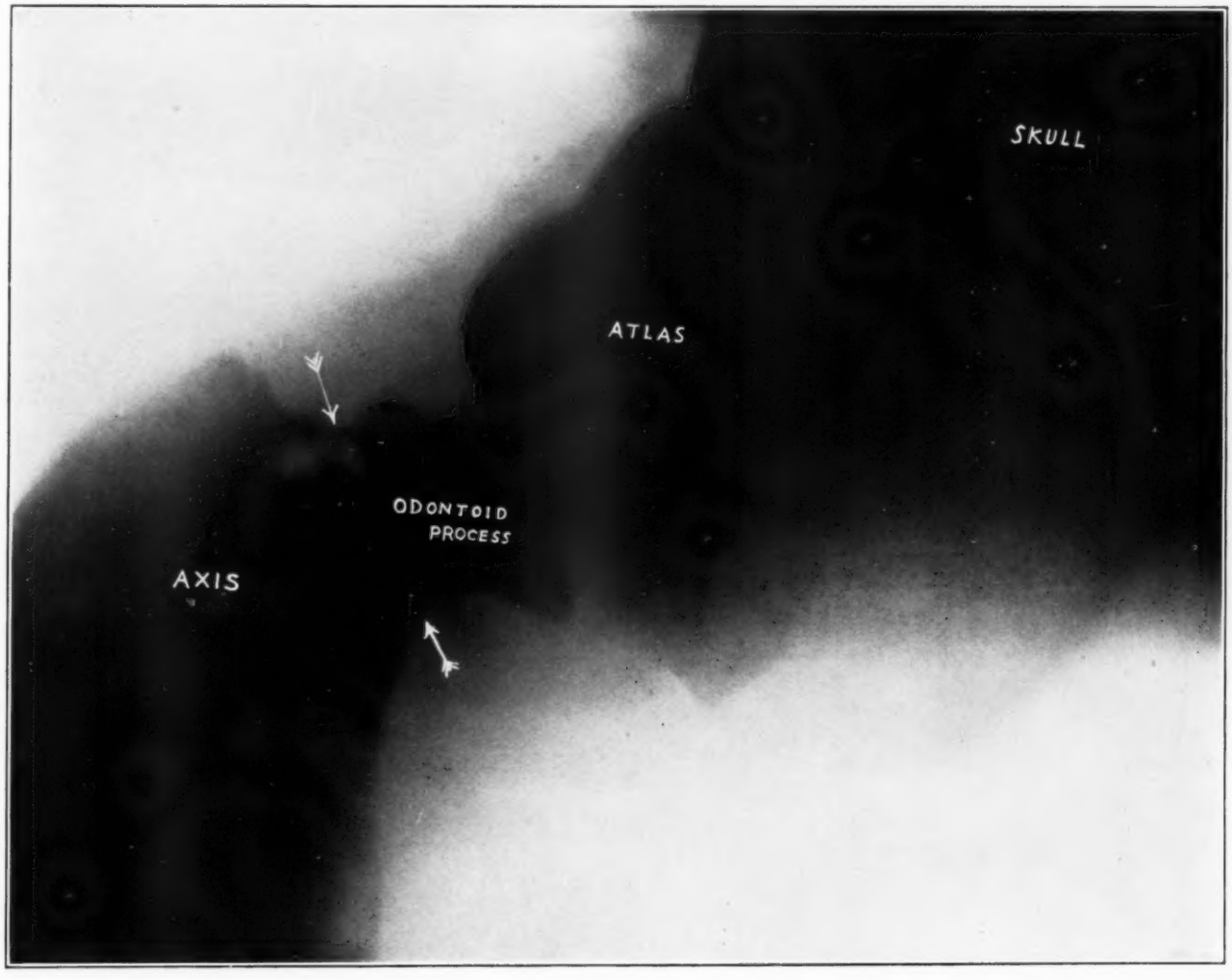
ETHICAL PHARMACEUTICALS ASSOCIATION

We are aware of the special difficulties in the process of business expansion with which those firms are faced who make every effort to restrict the sale of their products to professional men, and for this reason we trust that a full measure of success will attend the formation of an association, under the above title, of firms representing manufacturers of preparations not advertised to the general public. The chief objects of the Association—of which we note with pleasure that our friends Mr. Flint, of Sandoz Products, and Mr. Henry, of Bayer Products, Ltd., are Chairman and Vice-Chairman respectively—are to represent and conserve the interests of the members, to afford a means of exchange of views in matters of mutual concern and, in general, to act on behalf of members on all trade matters.

AXIAL FRACTURE IN A RACEHORSE



Abstracts

[**Gas Gangrene in the Horse.** Berge, E., and Meyn, A. (1934.) *Arch. f. wiss. u. prakt. Tierhlk. 68.* 5. pp. 305-321. (3 figs., 9 refs.)]

An account is given of three naturally occurring cases of gas gangrene in the horse, and of the experimental infection of the horse with different bacteria of the genus *Clostridium*.

Sporadic Cases

I.—A three-year-old horse had an encapsulated abscess forming a swelling in front of the left shoulder, which had existed for five weeks. Using chloral hydrate narcosis and local anæsthesia, the abscess was removed aseptically without being opened. A cavity the size of a child's head remained. The wound was treated daily with hydrogen peroxide and other antiseptics.

On the second day after the operation extensive œdema appeared around the wound and during the next three days the swelling increased in size and spread down to the knee and to the chest and ventral abdominal wall. The appearance and enlargement of the swelling was accompanied by fever. A maximum temperature of 40·8°C. (105·5°F.) was recorded on the fourth day after the operation. The wound itself appeared normal.

Collapse and death occurred on the fifth day.

Autopsy.—Œdematous infiltration of the entire musculature in the neighbourhood of the wound. *Cl. septique* was obtained in pure culture from the exudate.

II.—A nine-year-old horse had a soiled 12 cms. (about 5 inches) deep wound in the musculature of the croup, the result of a street accident half-an-hour previously.

The wound was cleansed with hydrogen peroxide and dressed with 1 per cent. rivanol solution. Tetanus antitoxin was injected.

Progress was satisfactory until the sixth day after the infliction of the wound, when the horse was unable to walk owing to the development overnight of an extensive swelling of the whole hindquarters. Death occurred on the same day.

Autopsy.—The wound penetrated deeply into the musculature of the croup, which was swollen, inflamed, softened, gaseous and reddish-black in colour. The subcutaneous tissue of the hindquarters and of the ventral abdominal wall was swollen, hæmorrhagic and œdematous. Early peritonitis. The spleen was slightly enlarged. The heart showed myocardial degeneration.

Cl. chauvei was obtained in pure culture from the lesion in the musculature.

III.—A 12-year-old horse had been injured three days previously by the shaft of a cart, which had penetrated deeply into the right inguinal region. The wound discharged a thin reddish exudate.

The wound was treated with hydrogen peroxide and rivanol solution. Tetanus and *Cl. septique* antisera were injected.

The next day the ventral abdominal wall, and the second thigh were very swollen. Temperature 40·4°C. (104·8°F.). The general condition became worse and death occurred five days after the injury.

Autopsy.—The musculature of the thigh was swollen and emphysematous. The viscera showed extensive degeneration.

Cl. welchii was obtained in pure culture from the muscle lesions.

EXPERIMENTAL GAS GANGRENE IN THE HORSE

(*a*) Infection with *Cl. Chauvœi*

Case 1: Subject: 20-year-old horse.

Ten c.cs. of virulent *Cl. chauvœi* culture, containing 250 M.L.D. for a guinea-pig, were injected subcutaneously into each second thigh.

The temperature rose to 38·9°C. (102°F.) ten hours after the injection but fell to normal in another 16 hours and remained so. An extensive and painful swelling developed at the injection sites in ten hours, but then gradually subsided and in six days had disappeared. No other constitutional symptoms were observed.

Case 2: Subject: 18-year-old horse.

Ten c.cs. of the same culture as in Case 1 were injected intramuscularly into each hind leg.

In five hours the temperature rose to 38·5°C. (101·4°F.) but fell to normal at the 12th hour and remained so. A transient lameness, but no swelling, was observed in one leg after two days. No other symptoms were observed.

(*b*) Infection with *Cl. welchii*

Case 3: Subject: 16-year-old horse.

Ten c.cs. of a liver-bouillon culture of *Cl. welchii*, containing 10 M.L.D.'s for the guinea-pig, were injected subcutaneously into the right second thigh.

A transient rise in temperature to 38·8°C. (101·9°F.) and swelling of the limb were observed, but the horse was normal again four days after the injection.

Case 4: Subject: 20-year-old horse.

Ten c.cs. of the same *Cl. welchii* culture were injected intramuscularly into the left thigh.

Temperature rose to 39·9°C. (103·8°F.) in ten hours and gradually returned to normal during the succeeding few days.

An extensive, painful swelling appeared near

the injection site in 12 hours, and then gradually disappeared. The horse was again normal eight days after the injection.

(*c*) Infection with *Cl. septique*

Case 5: Subject: 15-year-old horse.

Ten c.cs. of *Cl. septique* culture, containing 10 M.L.D.'s for the guinea-pig, were injected subcutaneously into the left thigh.

Four hours later a small painful diffuse swelling appeared at the injection site and in 12 hours had spread to the stifle and in 18 hours to the coronet. The swelling was then œdematous, emphysematous, and very sensitive to pressure.

The temperature gradually rose and reached a maximum of 41·5°C. (106·8°F.) in 21 hours. Death occurred a few minutes later, being preceded by collapse.

Autopsy.—The subcutaneous tissue of the affected limb and that of the posterior part of the abdomen, were œdematous. The musculature of the thigh was dry, very porous and brighter than normal in colour. The lungs showed œdematous fluid containing gas-bubbles. The heart exhibited severe myocardial degeneration and many sub-epicardial hæmorrhages. The spleen, liver, and kidneys were mushy and gaseous.

Cl. septique was obtained in pure culture from the viscera and blood.

Case 6: Subject: 16-year-old horse.

Ten c.cs. of the same *Cl. septique* culture were injected intramuscularly into the left thigh.

In four hours the temperature had risen to 40°C. (104°F.) and remained slightly lower until death occurred. In 12 hours the leg was swollen from buttock to hock and was painful and œdematous. In 36 hours, the swelling had spread further and standing was impossible. At 48 hours, the horse was in a state of collapse and died about 60 hours after the injection.

Autopsy.—The subcutaneous tissue of the affected limb was œdematous and in places hæmorrhagic. The musculature was dry and porous and in colour was reddish-black, dark red, or dark brown. The viscera were as in Case 5.

Histologically the affected muscle showed threads of necrotic fibres, some still striated, separated by a cellular exudate, which in places was hæmorrhagic.

Cl. septique was obtained in pure culture from heart blood and viscera.

(*d*) Infection with *Cl. novyi*

Case 7: Subject: 18-year-old horse.

Culture representing 10 M.L.D.'s for a guinea-pig was injected subcutaneously into the left thigh.

An œdematous, painful swelling appeared at the fourth hour, and at the 36th hour had extended to the second thigh and at the 72nd hour, to the abdominal wall and perinæum. The temperature was slightly elevated, appetite disappeared and death occurred 85 hours after the injection.

Autopsy.—The skin of the affected limb was stretched tightly. There was an amber-coloured, gelatinous, œdema subcutaneously. The musculature looked as if cooked. The heart showed severe sub-endocardial hæmorrhages. The other viscera showed no striking abnormalities.

Cl. novyi was obtained in pure culture from the muscular lesions but the heart blood and viscera were sterile.

Case 8: Subject 25-30-year-old horse.

The same volume of *Cl. novyi* culture as in Case 7 was injected intramuscularly into the left thigh.

In 12 hours a broad, circumscribed, painful, œdema appeared around the injection site. The swelling spread upwards and downwards until death occurred at the 62nd hour. The maximum temperature reached was 40°C. (104°F.), at the 36th hour.

Autopsy.—Subcutaneously was an amber-coloured, jelly-like exudate. The affected musculature was partly blackish-red and partly clay-coloured. The intermuscular tissue was distended and jelly-like. The heart showed sub-endocardial hæmorrhages. The lungs exhibited a jelly-like œdema.

Cl. novyi was obtained in pure culture.

Experimental Infection with *Cl. histolyticus*

Case 9: Subject: 15-year-old horse.

A volume of *Cl. histolyticus* culture, equal to 10 M.L.D.'s for the guinea-pig, was injected subcutaneously into the left thigh.

In 12 hours a painful, œdematous swelling appeared, and rapidly increased in size. At 36 hours, its contents were fluctuating, and at the 96th hour, it burst and discharged a thin, fœtid fluid, containing particles of necrotic tissue. Meanwhile, the general condition of the horse became bad, and death, preceded by collapse, occurred at the 123rd hour. The maximum temperature recorded was 40·8°C. (105·5°F.), two hours before death.

Autopsy.—Subcutaneously was a hæmorrhagic œdematous exudate. The neighbouring musculature varied in appearance, and was clay-coloured and opaque, or reddish-black and emphysematous. Pulpiness was absent. The myocardium looked as if cooked. The heart blood was partially clotted. The liver showed great parenchymatous degeneration. The blood in the lungs was foamy.

Cl. histolyticus was obtained in pure culture from the affected muscle and the heart blood.

Case 10: Subject: 18-year-old horse.

Ten g.p. M.L.D.'s of *Cl. histolyticus* culture

were injected intramuscularly into the left thigh.

In 12 hours, the temperature had risen to 40·0°C. (104°F.) and a painful, diffuse, swelling appeared. By the 48th hour, the swelling had spread to the hock and was fluctuating. It was lanced and a thin, brownish-red fœtid fluid escaped. The general condition of the horse was very bad. At the 72nd hour the swelling appeared emphysematous and the skin crackled on pressure. Death occurred after 79 hours.

Autopsy.—The subcutaneous tissue of the limb was œdematous and hæmorrhagic. The musculature was not emphysematous but was clay-coloured and opaque, and in places, mushy. The heart showed degeneration of the myocardium. Blood unclotted and foamy. The liver showed degeneration and foaminess.

Cl. histolyticus was obtained in pure culture from heart blood and affected musculature.

Histologically, the affected muscle showed acute inflammation, necrosis and lysis of the muscle fibres, and distension of the intermuscular connective tissue by exudate. Blood vessels were thrombosed.

CONCLUSIONS:

(1) The horse is extremely resistant to *Cl. chauvœi.*

(2) It is slightly less resistant to *Cl. welchii*, but the organism is not capable of producing more than a mild and transient inflammation.

(3) *Cl. septique*, *novyi* and ***histolyticus*** are capable of producing rapidly fatal attacks of gas gangrene, which clinically, are very similar but which show slight *post-mortem* differences—*viz., Cl. septique*: Hæmorrhagic serous œdema; *Cl. novyi*: Hæmorrhagic gelatinous exudate; *Cl. histolyticus*: Hæmorrhagic exudate and myolysis.

Septique and *novyi* are, in practice, of greater importance than ***histolyticus***, owing to the comparative rarity of the latter in the soil.

E. W. A.

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[Two Cases of Facial Palsy in the Horse. Argyle, E. P., and Davenport, C. (1935.) *J. Roy. Army Vet. Corps. 6.* 3. pp. 135-137. (2 figs.)]

Facial palsy in man and animals is now receiving considerable attention, and these cases are especially interesting as they include records of *post-mortem* findings. Sir Chas. Ballance referred to the more advanced case at a meeting of the Comp. Section of the Roy. Soc. of Med. last year.

In both cases the patient was thought to have injured itself while stabled, evidence of this being available in one case. One case showed typical symptoms of paralysis of the seventh cranial nerve, pronounced drooping of ear and lip on the affected side, while the other showed no involvement of the ear.

Sections were prepared from (1) the medulla-pontine region of the brain, (2) the facial nerve and (3) the geniculate ganglion.

The first case showed degeneration and disappearance of cells in the affected facial nucleus, a great increase in fibrous tissue causing pressure atrophy of the nerve bundles of facial nerve, and much morbid cellular change in the geniculate ganglion.

The microscopical findings were very similar in the second case, but the facial nerve lesion was more localised, being a fibrous mass the size of a walnut and adherent to the surrounding tissues at the angle of the ramus of the mandible, the presumed site of injury.

Commenting on these findings, the authors state that the facial nerve was chiefly involved near its exit from the stylo-mastoid foramen, causing paralysis of the attolentes muscle, with consequent drooping of the ear, in the first case, whereas involvement of the nerve in the other case was at a more peripheral point, *viz.*, after branching of the nerve to the attolentes muscle, with the result that there was no drooping of the ear.

They think sectioning of the neural sheath in the early stages of a case might be a useful method of treatment.

C. V. W.

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[The Castration of the Mare and its Prognosis. Richter, J. (1934.) *Berl. tierärztl. Wschr.* 50. 47 and 48. pp. 769-771 and 785-789 respectively.]

The writer describes his experiences in performing ovariotomy on 66 mares in ten years.

Technique.—For anæsthesia, he uses chloroform alone, or chloroform and epidural anæsthesia combined.

The dorso-vaginal method is preferred, and the incision is first made by a pair of sharp-pointed scissors, while the vaginal wall is held by fixation forceps, and is pulled in a downward direction, away from the rectum. The incision is then enlarged by the fingers, until the whole hand is admitted. At this stage difficulty is sometimes experienced by the novice. In some old mares, the wall is unexpectedly thick. In other cases, the hand finds itself in a pocket of peritoneum. In the latter case, the peritoneum is grasped by the fixation forceps, and is punctured by the closed scissors.

Richter's ovariotome is based on the principle of the emasculator.

Sequelæ.—Three mares died. Two deaths were due to hæmorrhage, before the scissor technique was adopted. The third death was due to peritonitis and injury to the rectum.

Four other mares were slaughtered on

account of chronic abdominal pain, three to six weeks after the operation.

In three cases, mild peritonitis, terminating in recovery, occurred.

Mortality.—A review of the literature shows that about 10 per cent. die. The death-rate is considerably lower in the hands of experienced surgeons.

Results.—Favourable cases are those in which nymphomania has existed for only a few months. Mares which are vicious owing to ill-treatment, or to inborn defects of temperament, are not likely to be improved.

Of the 51 survivors, 30 were cured or much improved. In 21 mares, there was no recognisable result, but many of these were slaughtered before adequate time had elapsed.

In the writer's experience, 75 per cent. of the recoveries showed improvement immediately and the remaining 25 per cent. within the next three months. Occasional recoveries occurred later than that.

It is generally agreed that mares over nine years of age are unfavourable cases, and this is in accordance with Richter's observations. He is unable, however, to agree with surgeons who say that cases of over a year's duration are unlikely to benefit—several recoveries have been obtained by him in such cases.

E. W. A.

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[Complications attending Castration of the Mare. Henkels, P. (1934.) *Deuts. tierärztl. Wschr.* August 4th. *42*. 31. 490-491. Author's summary.]

The complications attending the castration of mares consist chiefly in infectious and intra-abdominal and retroperitoneal hæmorrhages. The theories regarding the importance of the infection-resisting power of the endothelium of the reticulo-endothelial apparatus, to which also belongs the endothelium of the peritoneum, are well known. Consequently any antiseptic agents employed must be considerably weakened in order that no damage may be caused to the resisting power of the endothelium of the peritoneum. The intra-abdominal hæmorrhages produce either acute anæmia and, under certain conditions, bleeding to death, or the fibrin irritates the peritoneum locally to an exudative peritonitis which eventually leads to adhesions followed by emaciation and marasmus. The retroperitoneal hæmorrhages flow frequently into the excavatio recto-uterina and press on the rectum which can thereby be paralysed—the fatal complications of paralysis of the rectum are familiar.

In my opinion, the best means of preventing all these complications is to operate on the recumbent and deeply narcotised animal. The mare is to be laid on one side, the hind quarters slightly raised. With the knife protected, entry is made above the external mouth of the womb through the vaginal arch into the excavatio recto-uterina, without, however, piercing the peritoneum bluntly but opening the abdominal cavity with the protected knife, because by the blunt procedure the subperitoneal blood vessels are torn and thus the dreaded subperitoneal hæmorrhages occur. The removal of the ovaries is effected with the écraseur. With this it is important to execute the squeezing off as slowly as possible so as to avoid hæmorrhage. The greatest stress is to be laid on the importance of this slow removal. It can only be done in an appropriate manner on the recumbent and narcotised animal. Preparation for the operation consists in 24 hours' starvation, disinfection of the vagina, clearance of the rectum and bladder. After-treatment is not necessary.

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[Some Experiences with the Mouse Test for the Diagnosis of Pregnancy in Mares. Karmann, P. (1934.) *Deuts. tierärztl. Wschr. 42*. 437-439.]

The diagnosis of pregnancy in mares depends upon the demonstrations of œstrin in their urine or blood serum. This is recognised by the onset of œstrum in four-weeks-old female white mice which have received several injections of urine or serum, the amounts injected increasing from 0·1 to 0·3 c.c. The test requires six days for its completion but may be shortened and simplified by examining the vaginal discharge of the test animals on the third day without staining the smears and only staining the doubtful and positive smears on the fourth day when the reaction is at its height. Also, decreasing the number of injections to three saves time and trouble and does not affect the results. The test is not 100 per cent. correct and the author mentions several reasons for this; he is, however, quite satisfied that the results are sufficiently reliable to make it a valuable method for the diagnosis of pregnancy in mares.

J. A. N.

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[The Diagnosis of Pregnancy in Mares by Means of Blood Serum Tests. Magnusson, M. H. (1934.) *Rev. Gén. Méd. Vét. 43*. 321-336. 3 tables. (9 refs.)]

Following upon the reported success of using blood serum for the Aschheim-Zondek test for the diagnosis of pregnancy, the author has carried out a number of experiments on mares. The method employed was essentially similar to the classical method save that four immature female mice 6 to 8g. in weight were used for each test instead of five. Each test animal received five injections in 48 hours: one mouse was given 0·2 c.c., two mice 0·4 c.c. each and one mouse 0·6 c.c. of serum at each injection.

The animals were killed 100 hours after the last injection and their genital tracts examined. The results were considered positive when corpora lutea were visible in at least two of the mice. In doubtful cases, the ovaries were placed in glycerine for 15 minutes, pressed between slides and examined for the presence of a greyish, opaque, round body which is the appearance of a corpus luteum after such treatment. Other changes seen in the female genital tract were enlargement of the ovaries, uterus and follicles. Male mice were occasionally used for the test, the results being considered positive if the vesiculæ seminales were enlarged to three or four times their normal size.

Blood samples were obtained six to 15 weeks after service from 289 mares. In 140 mares proved to be pregnant, the results showed an error of 1·3 per cent. and in 149 mares proved to be non-pregnant the error was 2 per cent.

The author also studied the rapid method of Friedmann and Schneider for the diagnosis of pregnancy. This method depends on the fact that rabbits do not ovulate spontaneously but can be made to do so by the intravenous injection of 15 c.c. of blood serum from pregnant mares. An examination of the rabbits' ovaries 24 to 48 hours after the injection reveals whether ovulation has occurred or not. This method has given inconsistent results in the past which the author suggests are due to using rabbits which are too young. Since immature rabbits do not ovulate freely, animals weighing less than 1,400g. should not be used for the test. With this proviso, the author claims that this test gives results only slightly less reliable than those given by the mouse test.

The anterior pituitary and ovarian hormones are fairly stable substances and, by the addition of a little 1 : 1,000 chinosol solution to the samples, the author has been able to keep them at 4°C. for 270 days.

J. A. N.

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[**Ovariotomy of Mares.** Hodgkins, J. R. (1935.) *J. Roy. Army Vet. Corps.* 6. 3. pp. 144-147.]

The author frequently performed this operation in India, and this short article summarises his recommendations. The animal was always secured standing in stocks, and chloral hydrate anæsthesia used, the drug being given by stomach tube 20 minutes before operating. The preparation of the patient is important and is detailed.

He advises the preparation of two complete écraseurs on account of the risk of a broken chain, and, for puncturing into the abdominal cavity, he binds a scalpel to within three-quarters-of-an-inch of its point with tape, leaving a long tail to facilitate withdrawal. No antiseptics are used; the external genitals are washed with soap and water, and warm 1 : 20 solution of sodii bicarb. is on hand in sterilised buckets for syringing the vagina, and as a lubricant for the arms and instruments. This latter solution causes a ballooning of the vagina with the result that its taut wall is easily penetrated with a deliberate stab of the scalpel.

He next details the various steps of the operation and the care necessary to avoid bruising and hæmorrhage, and finally the after-treatment of the patient.

C. V. W.

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[**Experience in Ovariotomy in Mares by the Ventral Vaginal Route.** Holle, A., and Holle, J. (1934.) *Deuts. tierärztl. Wschr.* 42. 49. 784-786.]

These practitioners recommend perforating the vagina immediately below the cervix instead of above as most text-books used to advise. The matter has been discussed recently by various authors and the ventral approach has certain advantages [not discussed in this paper].

The important points to observe are: to have the mare starved for three days before operation in order to reduce the intra-abdominal pressure, to use chloral hydrate narcosis and to cast the mare into a specially constructed shallow pit in the ground with the shoulder at its deepest part and the hind part of the body stretched uphill.

The actual vaginotomy and ovariectomy are carried out in the orthodox manner, the authors advising that the actual écrasement should take three minutes to complete for each ovary.

The upper ovary is removed first and it may be necessary to roll the mare over in order to secure the other.

Post-operative complications have not been observed and the mares can usually return to normal work within four or five days of the operation.

J. E.

TUBERCULOUS CATTLE IN PEMBROKESHIRE

The disquieting statement that tuberculosis is on the increase among cattle in Pembrokeshire was made by the county veterinary surgeon, Captain A. J. S. Reynolds, at a recent meeting of the Contagious Diseases of Animals Committee of the Pembrokeshire County Council. Captain Reynolds reported ten cases of tuberculosis during the quarter, and declared that farmers had been buying indiscriminately in order to keep up their milk supply.

Mr. Vincent Johns, Fishguard, said that more herds were being inspected and he thought that more cases were coming to light for that reason.

Replying to the Clerk, the veterinary surgeon said he had not found any cases through applications for Grade A licences. In the past, most of the herds in Pembrokeshire had been self-contained, but now that there was a demand for extra milk, farmers were introducing cows from other areas.

Report

COUNTY OF DURHAM

Report of the Chief Veterinary Officer for the Year 1934

In his Annual Report to the Durham County Council for the year 1934, the Chief Veterinary Officer, Mr. H. Birkett Allan, deals with the work carried out by the Veterinary Department in two chief sections. The first section covers the administration of the Milk and Dairies Acts and Orders and the second one deals with the work under the Diseases of Animals Acts and Orders.

During the year under review 17 reports of tuberculous milk were received under Section 4 of the Milk and Dairies (Consolidation) Act, 1915, and in following up these infected milks 38 farms were visited. In twelve of the 17 reported cases cows suffering from tuberculosis of the udder, or passing tubercle bacilli in the milk, were detected on the farms concerned. In two of the remaining cases cows passing tubercle bacilli in their milk had been removed from the farms between the collection of the sample and the visit of the Veterinary Officer, and in the three remaining cases no source of infection could be found.

It is interesting to note that during the period reviewed there was an increase of from four to eleven premises licensed by the County Council under the Milk (Special Designations) Order of 1923 for the production of "Certified" milk, and an increase of from 25 to 30 persons licensed for the production of Grade "A" milk.

Under the Milk and Dairies Order of 1926, the Veterinary Officers paid 4,096 visits to farms and examined 43,127 cows, of which 34,737 were cows in milk, and as a result of these inspections 144 tuberculous cows were slaughtered. In addition, 223 cows were found to be suffering from mastitis and 146 animals were affected with various other pathological conditions.

The section of the Report dealing with the work under the Diseases of Animals Acts shows that during the year under review there were one case of anthrax, eight cases of sheep scab, 36 cases of swine fever, and 360 cases of tuberculosis. Of these 360 cases of tuberculosis 144 were detected by the staff, 165 were reported by the owners and 51 were reported by veterinary practitioners, etc.

In a section devoted to the examination of samples, it is interesting to note that tubercle bacilli were demonstrated microscopically in three bulk samples of milk, one of which was a mixed sample taken from twelve cows.

Another interesting feature of the Report is that portion dealing with the Milk Marketing Board's scheme for the provision of milk to school children. Approximately 470 milk producers have qualified to have their names added to the list of approved suppliers of milk to the County Council's schools, and 260 of these producers are already supplying milk to the schools.

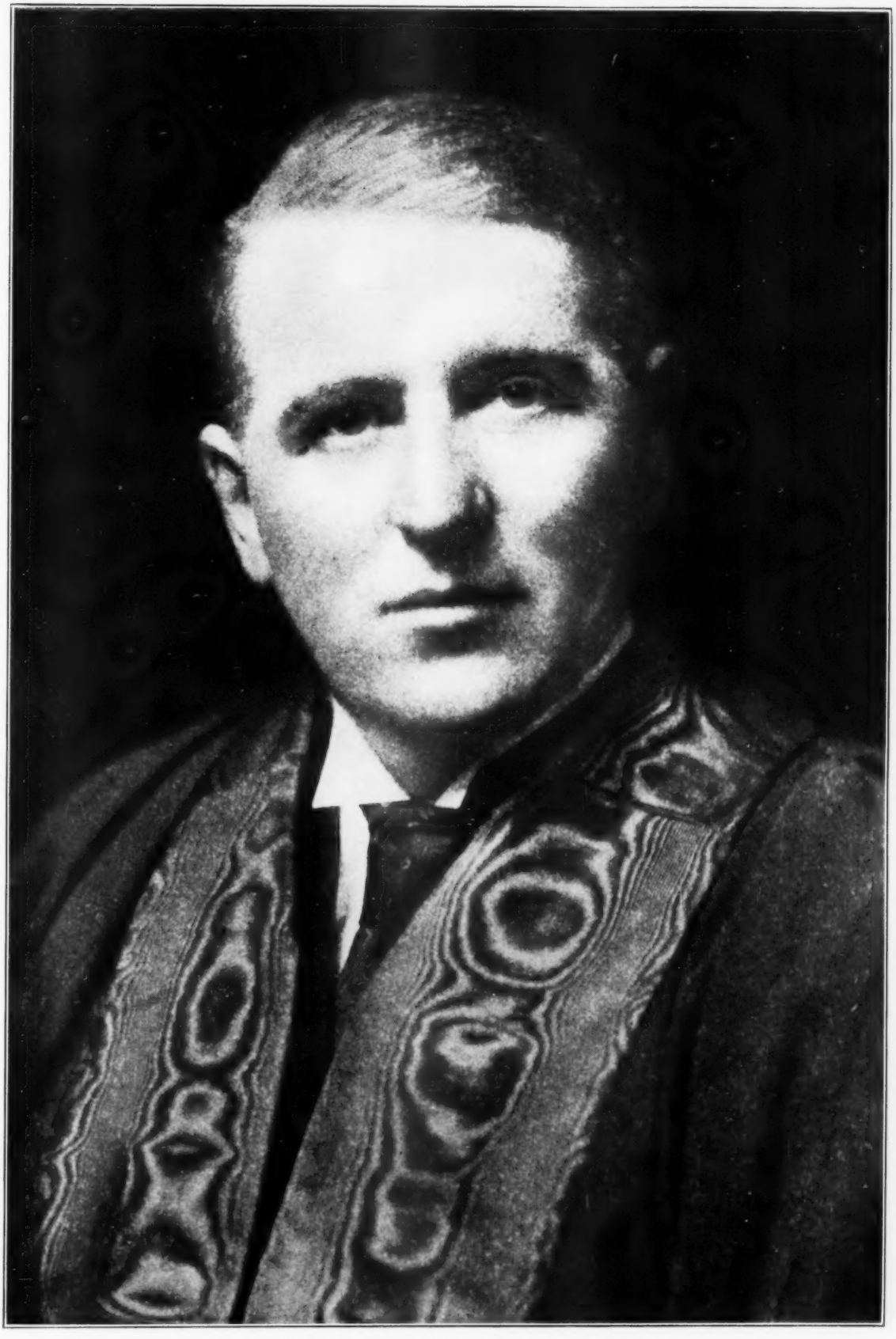
Obituary

MAJOR R. F. STIRLING, F.R.C.V.S., D.V.S.M., I.V.S.

Director of Veterinary Services, Central Provinces, India

By the death from heart failure, at Nagpur, India, on August 16th last, of Robert Ferguson Stirling, at the early age of 48 years, there has come to a sudden and unexpected end the career of a remarkable veterinary worker overseas. Having equipped himself for the task by a variety of experience, he had devoted unsparingly for some years his strong, resourceful, and industrious personality, with the aid of a devoted large Indian staff, to the control of animal disease in his province. The measure of his professional achievement, especially in applying new methods for the control of the country's most dreaded cattle disease, rinderpest, bids fair already to secure for him lasting fame as a benefactor of the common agricultural peoples of India.

Born on October 15th, 1886, of mixed Scottish and Irish parentage, at Kirkintulloch, Scotland, he was educated at Mountjoy school, Dublin. He had lost his father in childhood. After a splendid career as a student at the Royal Veterinary College, Dublin, during which he came particularly under the notice of the late Professor Mettam, he qualified as M.R.C.V.S. in October, 1907, and was appointed immediately to the Rhodesian veterinary service, in which he undertook work in the control of East Coast fever of cattle. His Fellowship certificate, which was awarded to him in December, 1912, was obtained on a thesis entitled "East Coast fever in Rhodesia and its Control." While on leave in England he resigned his post in the Rhodesian service and was appointed to a commision, dated September 16th, 1911, as lieutenant in the Royal Army Veterinary Corps, regular army. He resigned this commission on July 18th, 1913, thereafter taking up a commission in the Special Reserve, and electing to start in private veterinary practice in Lancaster, in proximity to his relative and lifelong friend, Dr. F. W. Bury, M.D. He was mobilised, however, at the outbreak of war, on August 5th, 1914, proceeding to France immediately where



MAJOR R. F. STIRLING, F.R.C.V.S., D.V.S.M.

Director of Veterinary Services, Central Provinces, India

he was wounded on October 3rd, 1914. He rendered service which called for high praise from his superior officers and was promoted Acting Major on August 22nd, 1918. After demobilisation, on April 17th, 1919, he returned to his private practice in Lancaster. He then resigned his army commission and was granted the rank of Major on April 28th, 1920. He soon decided, however, to relinquish practice and apply for a post in the Indian Veterinary Service, which he obtained towards the end of 1919, arriving in India in April, 1920, where he was appointed Second Superintendent, Civil Veterinary Department, Central Provinces. During his period of service, he obtained study leave to undertake the course for the Diploma of Veterinary State Medicine, at the Royal (Dick) Veterinary College, Edinburgh, securing the diploma with the very high marks in June, 1926. He afterwards officiated as Pathologist at the Imperial Institute of Veterinary Research, Muktesar, during the absence of the late Mr. Hugh Cooper on eight months' leave in 1927. He was appointed officiating Veterinary Adviser to Government, Central Provinces, upon the retirement of Mr. C. W. Wilson, in February, 1928, and after confirmation in this post his designation was changed to that of Director of Veterinary Services, in December, 1930. He was Major in the Indian Army Reserve of Officers, 1927-1935.

With the wide and varied training in his profession at his command, Stirling displayed during his service in the Central Provinces a unique capacity as an organiser and administrator of his department for the purpose of disease control, based on recent scientific advances and adjusted to meet the peculiar conditions of India. He was somewhat fortunate in this respect in having a department relegated to him by his predecessors in which the veterinary personnel was under the direct control of the central authority and not employed, as in some other provinces, mainly by district boards. He did much to infuse a spirit of professional enthusiasm among his Indian staff, and to this end founded the Central Provinces Veterinary Association, with its own quarterly *Journal*. In this work and during his extensive tours he was devotedly assisted by his wife, whom he had married in March, 1914; a tribute to the regard in which Mrs. Stirling is widely and justly held in India has appeared in *The Veterinary Record* of January 19th last. During his stay at Muktesar in 1927 he did some rather notable work: among other things, he identified there a disease of fowls which had been brought to the notice of the laboratory as occurring at the neighbouring station of Ranikhet with the Newcastle disease which had just then been described by Doyle in England; he also applied successfully on a large scale in practice tryparsamide for the treatment of the common Indian form of tick fever in dogs, caused by *Piroplasma gibsoni*. It was also during this stay at Muktesar that he was inspired to perform afterwards on return to his province the work which will probably stand as his greatest technical achievement. He had witnessed closely the experiments which had been carried out for some time by the then Director (Dr. Edwards) in attempts to adapt the virus of rinderpest to animals other than cattle, and consulted with him frequently on the possible economic significance of the modifications in virulence which were then becoming apparent in the virus after long passage in goats. The subsequent story of how vaccination of native Indian plains cattle was adopted in field conditions by inoculation with virus attenuated by goat passage (alone, without simultaneous serum inoculation) is reported in two well-known articles contributed by Stirling to *The Veterinary Journal* (1932, **88**, 192; and 1933, **89**, 290); the history is also briefly reviewed in a leading article in the issue preceding the 1932 contribution. Just before his death, it is understood that a third article was in course of preparation describing the further results obtained. The success of the method had been such that upon the recommendation of the Imperial Council of Agricultural Research, eleven specially trained Indian veterinarians were sanctioned last year to work whole-time under Stirling in the Central Provinces on goat-virus immunisation upon an extensive scale. The comparative safety of the method may be adjudged from the first batch of results forthcoming from the work of the special staff: in a personal communication written shortly before his death, it is said that 25,000 cattle had been inoculated, with two deaths only, which were ascribed to coccidiosis. This degree of success seems to have been attained through the cautious enterprise with which Stirling and his staff proceeded with the work: they had noted from some early set-backs the need for using an active virus obtained after prolonged goat passage, and for preliminary estimation of the degree of natural resistance possessed by the cattle indigenous to certain tracts in which inoculation was to be undertaken, and also for taking into account the risks due to relatively higher susceptibility in inoculating buffaloes in areas where the cattle readily withstood the inoculation. It is noteworthy in this connection that in some other countries such as Tanganyika where the method has been attempted, a similar degree of innocuousness has not been observed following upon the inoculation of the local cattle with goat virus—a result which may well be found to be attributable to the lower degree of basic natural immunity possessed by the

indigenous cattle of those countries as compared with the high degree long recognised in Indian plains cattle. Stirling's work has now been repeated in other provinces in India, and the accounts given in the annual reports of the several veterinary departments invariably testify to most encouraging results.

Besides the application in practice of the above somewhat novel method of rinderpest control, Stirling deserves credit also for the manner in which he attacked the economically highly important problems of bovine hæmorrhagic septicæmia, by preventive vaccination, and blackquarter, by "aggressin" inoculation, in enzoötic areas. Much useful information, of high significance, was also collected by his department on foot-and-mouth disease, three-day sickness, and plant poisoning.

He was accorded a most impressive military funeral at Nagpur; all local Europeans and large bodies of Indians attended, among all classes of whom his genial, spirited and commanding figure had been held in the highest regard and affection; the Governor of the province laid the first wreath upon his grave. Our deepest sympathy goes out to his widow and to his invalid mother.

J. T. E.

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Major R. F. Stirling, R.A.V.C., (S.R.) (RETD.)

(An Appreciation)

MAJOR-GENERAL SIR JOHN MOORE,
K.C.M.G., C.B., F.R.C.V.S.

It is with very sincere regret that I have heard of the sudden death of Major R. F. Stirling. He was one of my first officers with the British Expeditionary Force in France, being attached as a Lieutenant, Royal Army Veterinary Corps (Special Reserve) to the XXXIV Brigade, Royal Field Artillery of the 2nd Division, when that Division mobilised for active service in August, 1914. During the whole of his military service he did most efficient and praiseworthy duty, and was awarded the 1914 Star, the British War and Victory Medals. While serving at the front he was wounded on October 3rd, 1914, but in spite of this he continued to render efficient service. Promotion to the rank of Captain followed in August, 1915, and he was promoted to the rank of Acting Major three years later (August 22nd, 1918). Acting rank was made permanent by *London Gazette* announcement dated April 27th, 1920.

India loses a very valuable veterinary officer whom it will be very difficult to replace—he has done so much for the advancement of veterinary science in that country.

N.V.M.A. Divisional Report

EASTERN COUNTIES V.M.A.*

SUMMER MEETING AT GREAT YARMOUTH

The Summer Meeting of the Eastern Counties Veterinary Medical Association was held at the Royal Masonic Assembly Rooms, Great Yarmouth, on Thursday, July 11th, 1935, with the President, Major W. H. Wortley, in the chair.

Before the meeting, about 20 members and their ladies lunched together.

The business meeting was held in the afternoon when, in addition to the President, the following members were present: Messrs. T. E. Barcham, A. J. Beeson, J. D. Broome, J. M. Currie, W. H. Dennett, J. G. E. Gallie, D. S. Jack, T. Love, H. V. Low, N. F. Pollock, E. Brayley Reynolds, J. Reid, W. Shipley, H. P. Standley, senr., F. Thurston, P. R. Turner, and the Hon. Secretary.

The minutes of the Annual General Meeting were taken as published in *The Veterinary Record*, and signed.

The minutes of the Special Meeting held at Diss were read and signed.

Correspondence.—(1) Letters regretting their inability to attend were received from Messrs. W. J. Browning, H. Buckingham, J. Buckingham, E. A. Burgon, A. F. Castle, Sir Frederick Hobday, W. F. Howes, H. J. Loveless, W. F. Loveless, G. T. Matthews, F. W. Medlock, C. C. Nesling, W. Waters and P. J. Welch.

(2) From the Royal College of Veterinary Surgeons, asking the Division to vote an annual donation for the Library Endowment Fund. By a small majority it was decided to send an annual donation of £3 3s.

(3) From the National Veterinary Medical Association with reference to braxy-like diseases in sheep; also, to the duties of Veterinary Advisory Officers.

(4) From the National Veterinary Medical Association, regarding the resolution submitted from the Diss meeting: "That every qualified veterinary practitioner should be entitled to give a certificate under the Accredited Herd Scheme," pointing out that there are a number of practitioners who by reason of the nature of their practices, are not called upon to carry out these examinations. The Veterinary Officers and Public Health Committee of the National Veterinary Medical Association invited the Division to consider whether it would not be better to modify the resolution, and urge that the examination of herds should not be limited to those holding appointments under the Diseases of Animals Acts.

* Received for publication August 19th, 1935.

This was unanimously agreed to.

New Members.—Mr. J. Porrett (Thornage) and Mr. J. S. Sweeney (Colchester) were elected members of the Association.

N.V.M.A. Council.—A letter was received from Mr. G. T. Matthews, resigning as one of the Association's representatives on the Council of the National Veterinary Medical Association. The Secretary was instructed to write and thank Mr. Matthews for all he had done for the members in the Eastern Counties, and Mr. E. Brayley Reynolds was elected in his place.

Next Meeting.—It was decided to hold the Autumn Meeting at Cambridge early in October.

Resolution.—A resolution to alter Rule 3 to read: "The entrance fee to be 10s. 6d. for each member and an annual subscription of £1 1s.," proposed by Mr. C. C. Nesling and seconded by Mr. H. P. Standley, senr., was defeated by a large majority.

President's Address

The President (Major Wortley) then gave his Address from the Chair, which was as follows:—

It was with a certain amount of trepidation that I accepted the honour you have conferred on me by electing me as your President for the ensuing year, but I am none the less grateful and thank you sincerely for that honour.

According to ancient custom I have to deliver what I see is sometimes called a "valedictory address," and so I propose to discourse briefly the signs of the times as I interpret them.

Before commencing any subject the question to be considered is the adequate understanding of the terms to be used. In considering disease (with which we as veterinary surgeons have to deal) the question requiring an answer is: What is disease? Disease is any departure from the normal state of the animal body—accepting "normal" to mean the state of the greatest number of the particular animal species dealt with. The state of disease or abnormality may be occasioned by infecting agents, *e.g.*, bacteria, protozoa, animal parasites, etc., or by accidents, by lack of food or some food element, *e.g.*, vitamins, or by other nutritional errors. It follows, therefore, that in order to cure disease one must have a knowledge of the causes which upset the balance of health preserved by animals. One can argue that it is more difficult to cure a disease than to prevent it, even provided that we have knowledge of the causes responsible for its occurrence. In the same way it is easier to keep a car running in good order by applying our knowledge of its mechanism than to repair a breakdown due to carelessness or some error. As practitioners of veterinary medicine we have chosen the more difficult art—namely, that of curing a disease than of preventing it. But it is being borne on us more and more that the day of preventive medicine is arriving and one is prompted to think that in due course attempts at curing disease in animals will be still more confined to pets and relatively valuable livestock.

What are we going to do about the changing outlook in veterinary medicine? It follows that we shall have to study the maintenance of animals in health. This necessitates a knowledge of animal nutrition, prevention of access of infection, and also the spread of infection. This latter necessitates the early diagnosis of disease, which cannot always be accomplished without the aid of laboratory workers skilled in such work.

There is another point to be borne in mind, and that is the prevention of disease from a public health standpoint. We know human beings may acquire infection from various animal diseases such as from tuberculous milk, from glandered horses, and from rabid dogs. Happily these two latter diseases need not worry us much at the present time in this country, but the first-mentioned—tuberculosis—is a menace to the milk-consuming public. Furthermore, there are other diseases spread to human beings by infected milk but upon which I need not dwell. The point at issue is how we, as the Veterinary Profession, are going to play our part in (*a*) preventing epidemics and so help the farmer to avoid losses or keeping unprofitable animals, (*b*) preventing infection of human beings with diseased animals or animal products.

The general tendency, following on that obtaining in the medical world, is to appoint whole-time men in order to control certain of the well-known contagious diseases: either those diseases which are likely to cause widespread havoc among livestock, *e.g.*, foot-and-mouth, swine fever, or those which might have some ill-effect on human beings.

However, we must face this fact and not let any personal element creep in when we note the above-mentioned tendency on the part of the authorities in their endeavour to protect the public in what they consider a more efficient way. Secondly, if we quarrel, then we should remember that "a house divided against itself cannot stand." We are too small a profession to be divided. Thirdly, most of the men appointed have had additional training and should be able to carry out their work efficiently. It may be argued that experience and/or additional training are lacking in some individuals. The additional training will be necessary in the future when the appointment of such men is more of an established fact than it is at present whilst this radical movement is in its

infancy. Experience will be acquired during the years to come. Tact, co-operation and friendliness will ease the condition if practised on both sides, and I urge my fellow practitioners to play their part in this matter. Nothing can be gained by opposition and non-co-operation, but if we realise that this is a state of affairs which is coming and cannot be resisted, because of its manifest advantages to the public, then we shall accept the position—play our part in keeping herds free from disease—helping towards a higher state of public health.

Tuberculosis Eradication.—Captain J. D. Broome then made a few remarks on the merits and demerits of the Tuberculosis (Attested Herds) Scheme. This gave rise to a lively discussion.

Exhibits.— Mr. P. R. Turner exhibited the kidneys and bladder of a Cairn terrier, showing well-marked lesions of pyelo-nephritis and cystitis, the interesting part of this case being that he had been treating this dog six months previously for skin trouble, when it had shown no symptoms of any urinary trouble.

Bowls Tournament.—The Bowls Tournament for the Shipley Cup was held after the business meeting, resulting in a win for Mr. J. G. E. Gallie, who beat Mr. J. F. Thurston in the final. The sum of £3 5s. was collected on behalf of the Victoria Veterinary Benevolent Fund in connection with this tournament.

The President then entertained the members to tea, and a very pleasant afternoon was wound up with a vote of thanks to the President for his able address and for his hospitality.

H. P. Standley, junr., *Hon. Secretary.*

STATIONERY OFFICE, DUBLIN

The undermentioned publications have recently been issued by the Stationery Office, Dublin, and may be purchased from the Government Publications Sales Office, 5 Nassau Street, Dublin, C.2.:—

	Price.	*Postage.*
Diseases of Animals Bill, 1935:—		
21/35. As introduced ...	0 2	0 ½
Agricultural Produce (Fresh Meat) (Amendment) Bill, 1935:—		
22/35. As introduced ...	0 2	0 ½
Slaughter of Cattle and Sheep (Amendment) Bill, 1935:—		
24/35. As introduced ...	0 3	0 1
24A/35. As passed by Dáil Eireann	0 3	0 1
185/35. Agricultural Products Hides and Skins of Animals) (Transfer of Functions) Order, 1935 ...	0 1½	0 ½

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A Jersey cow, Richmond Posy V., owned by the Hawkesbury Agricultural College, Australia, has produced during her last lactation periods, four of 12 months and one of nine months, 75,189 lb. of milk and 4,517 lb. of butter fat, equal to 5,440 lb. of commercial butter.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Sept. 23rd.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4 p.m.

Sept. 24th to 25th.—Jubilee Memorial Prize Examination.

Sept. 25th.—Meeting of the Society of Veterinary Practitioners, Grand Hotel, Birmingham, 2 p.m.

Sept. 27th.—Meeting of the Southern Counties Division, N.V.M.A., at Southampton, 2.30 p.m.

Sept. 30th.—N.V.M.A. Committee Meetings, 2, Verulam Buildings, W.C.1.

Oct. 1st.—N.V.M.A. Committee Meetings, 2, Verulam Buildings, W.C.1, and Council Meeting, Connaught Rooms, Great Queen Street, W.C.2.

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PERSONAL

On Leave.—The following Colonial Veterinary Service Officers arrived home on leave during the month of August: Messrs. J. De Meza, Chief Veterinary Officer, Nyasaland; A. Fulton, Veterinary Officer, Gold Coast; D. F. Macpherson, Veterinary Officer, Agricultural Department, Kenya, and T. F. O'Brien, Veterinary Officer, Nigeria.

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R.C.V.S. OBITUARY

Lowe, William Cecil, o.b.e., f.r.c.v.s., Lieut.-Colonel R.A.V.C. (retd.), Wincote, Eccleshall, Staffs. Graduated London, December 17th, 1896. Died August 31st, 1935; aged 60 years.

Lieut.-Colonel Lowe was a son of the late Mr. I. S. Lowe, of Donnington, and was born in that town in 1875. He was educated at King Edward's School, Birmingham, and joined the Army at the age of 21. He served in Cape Colony and Bechuanaland in 1897, and in South Africa with Lord Kitchener's Fighting Scouts in 1900. He became a lieutenant in the Army Veterinary Department in 1901, and Deputy Director of Veterinary Services, Southern Army, India, in 1917. He was on the General Staff in India and Egypt in that year. In 1918 he was promoted A.D.V.S. Irish Command, and in the following year was A.D.V.S. 6th Corps of Occupation, Cologne. In 1921 he was A/D.D.V.S., Cairo. He was the holder of the Queen's Medal (South Africa) with four clasps, the King's Medal with two clasps, and several medals for his services during the Great War.

Colonel Lowe married in 1909 Marie Louise, daughter of the late Rev. J. L. Clougher, of Blaenavon, Mon., and is survived by her, and by their son and two daughters. Colonel Lowe was the youngest brother of the late Lieut.-Colonel T. E. Lowe, of Wolverhampton.

A prominent Freemason, Colonel Lowe was W.M. of the Eccleshall Lodge 5889, P.P.C.P. of the Order of Knights Templar (Bombay District) and 30th Degree of the Ancient and Accepted Rite (India).

The funeral service was conducted by the Rev. C. P. Way (vicar), and the Masonic oration was read by Mr. E. J. H. Ellison, I.P.M., and secretary of the Eccleshall Lodge, of which Lieut.-Colonel Lowe was Worshipful Master. Major Chambers, with Mr. J. Wright Conchie, Kidderminster, represented the Midland Counties Veterinary Medical Association, who also sent a floral tribute.

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THE THREAT TO THE HORSE

Opposition by London Organisations

An effort is being made in London to organise opposition to the proposal, recently foreshadowed by the Minister of Transport in the House of Commons, to ban horse traffic from certain areas.

Mr. Charles A. Wells, a member of a firm who have secured a number of valuable prizes in competitions for commercial horses at Olympia and Richmond, speaking in favour of retaining horses in the streets of London, said (observes *The Times*) that the City streets were so narrow in certain places that horse traffic was much more convenient than motor vehicles. His firm carried a good deal of gold and silver from the docks to London banks, and it often happened that the loads had to be transferred from motor-lorries to horse vans in order to reach the bank premises.

The London Cartage and Home Counties Haulage Contractors' Association are considering the probable effect of the proposed ban, and have been in consultation with other organisations, particularly with the National Horse Association, on the question. A joint meeting of the two bodies will be held at the offices of the National Horse Association, Hanover Square, on September 23rd.

It is pointed out that the prohibition of horses from the London produce markets would cause hardship to traders, as the congestion which is inevitable at these places causes frequent and prolonged delays, making the use of mechanical transport very expensive.

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GERMANY'S HORSE CENSUS

Germany is taking a census of her available horse strength, and all owners of horses have been instructed to parade their animals and vehicles before the police authorities. It is stated that the authorities are seeking reliable information as to the quality of the horses.

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ARMY VETERINARY SERVICE

London Gazette—War Office—Regular Army

Sept. 6th.—The following Lts. (on prob.) are confirmed in their rank: S. L. Trevor, D. Mack. Stewart.

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TWELFTH INTERNATIONAL VETERINARY CONGRESS

The first of the three volumes of the Proceedings of the Twelfth International Veterinary Congress, New York, has now been posted to members. The second and third volumes will follow shortly.

Any member of the Congress who has not received his copy should communicate with Dr. H. Preston Hoskins, General Secretary, Twelfth International Veterinary Congress, 221, North LaSalle Street, Chicago, Ill., U.S.A.

The British Association

MEETING AT NORWICH

Nearly 100 papers a day have occupied the attention of the members of the British Association for the Advancement of Science throughout their meeting at Norwich. At an early stage of the proceedings the general committee of the association formally elected Sir Josiah Stamp as president for the year 1936, when the association will meet at Blackpool. The committee had previously accepted an invitation from Dundee, and it was decided that the association should go there in 1939. An invitation to go to Belfast was accepted, but without the year. In 1937 the association will be at Nottingham and in 1938 at Cambridge.

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THE PRESIDENT'S ADDRESS

The President (Professor W. W. Watts) devoted his address to the subject of "Form, Drift, and Rhythm of the Continents." When dealing with the evolution of life, the President said: "Evolution of life on the earth has been by no means uniform; there have been periods of waxing and waning which may be attributed to geographical, climatological, and biological influences. The development of large land areas, ranged longitudinally or latitudinally, the invasion of epi-continental seas, the isolation of mediterraneans or inland seas, the splitting of continental areas into archipelagos or the reunion of islands into continuous land, the making of barriers by the rearing of mountain chains or the formation of straits or arms of the sea, the oncoming of desert or glacial climates; all such factors and many others have been of importance in quickening or checking competition, and in accelerating or retarding the evolution of life.

"Probably, however, even greater effects have followed the interaction of groups of biological changes on one another. As an example I might recall Starkie Gardner's estimate of the results following upon the first appearance of grasses in the world. This seems to have been not earlier than Eocene, and probably late Eocene times. By the Oligocene they had made good their hold, peculiarities in their growth and structure enabling them to compete with the other vegetation that then existed; and gradually they spread over huge areas of the earth's surface, formerly occupied by marsh, scrub and forest. They have, as Ruskin says, 'a very little strength . . . and a few delicate long lines meeting at a point . . . made, as it seems, only to be trodden on to-day, and to-morrow to be cast into the oven'; but, through their easy growth, their disregard of trampling and grazing, and by reason of the nourishment concentrated in their seeds, they provided an ideal and plentiful source of food.

"On the establishment of the grasses, we find that groups of animals, which had previously browsed on shrubs and trees, adopted them with consequent alterations and adaptations in their teeth and other bodily structures. To follow their food from over-grazed or sun-scorched regions they required to be able to migrate easily and quickly, and it was essential for them to discard sedentary defence and to flee from threatened danger. Such defence as was possible from heels, teeth or horns they retained; but the dominant modifications in their organisation were in the direction of speed as their vital need.

"Side by side with this development, and in answer to increasing numbers, came bigger, stronger and speedier carnivores, to feed on prey now so much more abundant, but more difficult to catch. The answer of the grass-feeders, with their specialised hoofs, teeth and bones, better suited to flight than fight, was to seek safety in numbers, and thus develop the herd instinct, with its necessity for leadership and discipline; but this, in turn, provoked a like rejoinder from some types of their enemies.

"When it is remembered how much of the meat and drink and life of mankind is bound up with the grasses, including wheat, maize, millet and other grains, sugar-cane, rice and bamboo, we must realise how close is his link with the development just outlined. Practically his whole food supply is provided by them, either directly by the agriculturalist who grows little else but grasses, or indirectly by the herdsman whose domestic animals are fed chiefly on the same food. Nor must we forget that almost every one of our domesticated animals has been derived from the gregarious types just mentioned, which have accepted the leadership of man in place of that of their own species.

"It is perhaps not too much to say that the magnificent outburst of energy put out by the earth in the erection of the Alps, Andes and Himalayas in Tertiary times, was trivial in its influence for man's advent and his successful occupation of the earth in comparison with the gentle but insidious growth of 'mere unconquerable grass' and its green carpet of 'wise turf,' which in some form clothes by far the greater part of the land of the globe."

Development of Brain

Another interesting subject dealt with in its geological relationship in the course of Professor Watts' address was the development of the brain.

"The kind of developmental reaction of which this is but a single example must clearly have had influence on bodily features other than bones and horns, teeth and claws, speed and strength; and one of the most striking has been on the intellectual development and the size and shape of brain.

"We do not, and perhaps can never, know the quality of the material of which the brain of fossil creatures was made, for we have no instrument to pierce the veil of time as the spectroscope has penetrated the abysm of space. But we are even now learning something about their shapes and convolutions, and more about their mass in its relation to the size of the bodies controlled; from the time of the earliest Ordovician fishes, through the history of the amphibia, reptiles, birds and mammals, up to man himself.

"The brain of those gigantic if somewhat grotesque reptiles the dinosaurs, the tyrants of Mesozoic time, was relatively tiny. In *Diplodocus*, 80 feet in length and 20 tons in weight, the brain was about the size of a large hen's egg. It is true that there was a big supplementary sacral ganglion which may have taken chief charge of locomotion and helped to secure co-ordination throughout the hinder part of its huge length and bulk; but of true brain there was not more than a quarter of an ounce to control each ton of body and limb; and we begin to understand why they lost the lordship of creation.

"The proportion of brain to body improved in those reptiles which took to flying, possibly in relation to their acquisition of warm blood, and in the birds evolved from reptiles; but it is only in mammals that a marked advance is seen. Here the brain of *Uintatherium*, a great rhinoceros-like animal of Eocene date, weighing two tons, was about the size of that of a dog. This proportion of half a pound of brain to each ton of body shows how far the mammals had gone and still had to go. A twelve-stone man of the present day has about 3½ pounds of brain—an amount not far short of half a hundredweight per ton.

"Even though we can know nothing of its material, this steadfast growth in the guiding principle, through the millions of centuries that have gone to its development, is surely one of the most remarkable conclusions that we owe to geology. Of all the wonders of the universe of which we have present knowledge, from the electron to the atom, from the virus and bacillus to the oak and the elephant, from the tiniest meteor to the most magnificent nebulæ, surely there is nothing to surpass the brain of man. An instrument capable of controlling every thought and action of the human body, the most intricate and efficient piece of mechanism ever devised; of piercing the secrets and defining the laws of Nature; of recording and recalling every adventure of the individual from his cradle to his grave; of inspiring or of ruling great masses of mankind; of producing all the gems of speech and song, of poetry and art, that adorn the world, all the thoughts of philosophy and all the triumphs of imagination and insight: it is indeed the greatest marvel of all.

"When we contemplate the time and energy, the sacrifice and devotion, that this evolution has cost, we must feel that we are still far from the end of this mighty purpose: that we can confidently look forward to the further advance which alone could justify the design and skill lavished on this great task throughout the golden ages that have gone."

The Darwin Centenary

On September 16th, 1835, Charles Darwin landed on the Galapagos Islands, the study of which was of such profound importance in the development of his ideas on evolution. The Section of Zoology commemorated his centenary by a special meeting.

Professor MacBride paid a tribute to Darwin's powers of observation and description. He was followed by Mr. Parker, of the Natural History Museum, who gave a gloomy account of the destruction of the unique animals inhabiting the Galapagos Islands, notably the giant tortoises and the large land lizards. Men had been their main enemy, but of recent years an equally serious danger threatened from the rats, cats, dogs, and other animals introduced by man. The result was that most of the species were undoubtedly doomed to extinction unless firm action was taken. The Government of Ecuador, he was glad to be able to announce, had passed an Act setting aside certain islands as sanctuaries and prohibiting the killing or taking of all the interesting species. However, this was likely to remain a dead letter unless steps were taken for active improvement. He ended with a plea for action by the British Association, in view of its intimate association with Darwin's memory as custodian of Down House.

Professor Huxley then moved a resolution calling upon the British Association to take the initiative in summoning a committee to take action in the matter, and this was carried unanimously.

The Species Problem

Professor F. Balfour-Browne put forward some conclusions as to the origin of species by means of natural selection in his presidential address to Section D (Zoology). The address was summarised as follows in *Nature*, September 7th.

Professor Balfour-Browne "points out that, although a struggle for existence undoubtedly occurs, choice also plays a part in the formation of different communities of water-beetles associated with different types of habitat, and that even localisation under particular climatic conditions is probably partly due to choice.

"Choice of a particular food-plant by certain individuals of a species may give rise to biological races, such as are known to exist in Nature and can be produced artificially, and such races may be one source of origin of new species. In any group, species are variously related, some being very distinct while others form clusters and are difficult to distinguish. The clustered species are not usually members of the same community and may perhaps be accounted for on the assumption that they originated as biological races. As to these clusters, there seems to be no evidence that the distinctive characters are hereditary; and it seems possible that they are merely due to the effect of environment upon each succeeding generation.

"The majority of the species-characters by which the water-beetles are separated are non-vital and cannot therefore have evolved through the action of natural selection. In some cases the structure is common to other groups but the function is different. The clubbed antennæ found in Hydrophilidæ have appeared several times in the Coleoptera, but if they had been wiped out in all these other groups before the Hydrophilidæ were first studied, we should doubtless be describing them as specially evolved in connection with respiration in these beetles.

"Among these species-characters it is possible to trace what might be called stages in their evolution running through whole groups or families, suggesting that, just as growth is a definite property of the organism, so evolution is an inherent property of the species. But the discoveries in connection with chromosome control of characters suggest that possibly what has been described as ortho-genesis may be the result of mutations caused by external stimuli or, if function can produce an alteration of structure, physiological activities may produce these lines of evolution on the assumption, still requiring proof, that acquired characters are inherited. The inheritance of acquired characters must also depend upon the ultimate effect of changes of habit, physiological activity and structure upon the germ-cell chromosomes, so that the real struggle for existence seems to be in these latter, the first function of which is to see that like produces like, while external influences are perpetually endeavouring to prevent them carrying out their duty."

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The Pituitary Gland

Professor P. T. Herring delivered a presidential address to Section I (Physiology) on the above subject. This is summarised in *Nature* as follows:—

"The anatomical and physiological connection between the pituitary and diencephalon form the subject of Professor P. T. Herring's address. The diencephalon itself is the site of integration of nervous impulses concerned in the regulation of many of the fundamental processes of life. The pituitary body is the only one of the diverse structures of the diencephalon which receives an accession of epithelium from an outside source—the buccal epithelium. These epithelial elements of the pituitary form one of the most important structures of the diencephalon.

"The pituitary body provides the brain with an armamentarium of hormones, which are secreted in several ways. Quite a large number of hormones are now allocated to the pituitary, and more may be discovered. Some of these exert their actions directly upon peripheral tissues through the blood stream; others act locally upon nervous mechanisms in the hypothalamus. All are under the control of this part of the brain.

"From the anterior lobe are secreted hormones which stimulate growth and exercise a controlling influence over the gonads, thyroid, parathyroid, thymus, cortex of the suprarenals and the mammary glands. Some also influence metabolism, especially of carbohydrate and fat.

"Pituitrin, an extract of the posterior lobe, has so far been separated into two fractions. One has a pressor effect. There are, however, anomalies in its action. It is also considered that the secretion of the posterior lobe is essential for the preservation of capillary tone. The other portion of pituitrin acts upon uterine muscle. The relationship of the secretion of the posterior lobe to the metabolism of carbohydrate and of fat is still obscure. Many other activities of the posterior lobe have been described and postulated, but one may well question if all be normal functions.

"Nevertheless, one is compelled to conclude that the active principles of the pituitary are such as are necessary for the regulation of common and fundamental processes in the life of the animal. The diencephalon and pituitary body form a working unit, and have far reaching importance in the control of fundamental physiological processes. It is probable that the pineal body is another part of the same mechanism, but its functions are still to be discovered."

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State Control in Agriculture

The presidential address to Section M (Agriculture), delivered by Dr. J. A. Venn, is summarised as follows in *Nature*, September 7th:

"In his presidential address Dr. J. A. Venn discusses the 'Financial and Economic Results of State Control in Agriculture.' A rather full criticism is made of agricultural economies and organisation from the end of the Napoleonic wars, until the beginning of the Great War—including that 'period of rural depression of the 'nineties . . .' which finally passed 'without affecting either the National outlook or the National purse.'

"The war years were a period of rigid control and are therefore not considered. The present period began in 1922. The cost to the State of reliefs and disbursements is estimated. For example, the subsidising of sugar and molasses derived from home-grown sugar beet has been, during eleven years, slightly more than £47,000,000. The Forestry Commission will, in 15 years, have expended £6,000,000. Non-returnable State contribution to the Milk Marketing Board amounted in 1934-35 to £1,600,000, and within a year £2,924,000 have been expended on the beef subsidy. Reliefs from rating must represent some £15,000,000 annually.

"Recent tendencies involve a slight increase in output of the soil, a decline in arable area, a transference from production of feeding-stuffs to that of sale crops, a reduction in number of workers, and a redistribution between the different classes of livestock. Of the expenditure that these results have involved, landowners have directly received little, and continued to deteriorate. Tenant-farmers have partly bridged a gap to save them from impotence as producers; while rural workers have received an increase of 75 per cent. in wages. Recent 'planned' agriculture gives a figure of £40,000,000 in annual benefits derived from grants, remissions and augmented prices. It is arguable to what extent the middlemen's returns have been affected; but it may concern intimately the consumer. The direct tax-payer has gained a measure of respite, at the expense of the indirect.

"A vast change has occurred in the problems of agriculture during the past 100 years, and consideration has ousted severity, and preferential treatment superseded *laissez-faire*. Agriculturalists are faced with the twin problems of over-production and under-consumption. The most recent proposals involve a movement from quotas to levies, with a modicum of Dominion preference. Nevertheless, British agriculture has gained a protective covering to shield it from the worst economic shocks. But this may actually hamper it when progressing over the smoother terrain of normality which it is hoped lies ahead. Possibly the near future will witness some relaxation from control and some restoration of individual liberty of action."

Disruptive Colouration in Animals

Dr. Cott, of Glasgow, read an interesting paper to Section D, illustrated by beautiful photographs, on "disruptive colouration" in animals. Disruptive colouration renders an animal inconspicuous by the breaking up of its outline and form through the superimposition of a disruptive pattern. Many useful lessons as to the proper use of camouflage in war may, Dr. Cott pointed out, be learnt by a careful study of this type of camouflage practised by animals in nature.

Dr. Thouless, the well-known psychologist, followed and discussed the psychological principles involved in the efficacy of disruptive colouration in nature. These can best be understood in terms of the theory of *Gestalt* or Configuration.

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LICENCES FOR CHICK SEXERS

Proposals for the control of chick-sexing are being considered by the National Poultry Council, following an investigation carried out at the request of the Ministry of Agriculture.

No definite scheme has yet been prepared, but it is understood that the main provision will provide for the examination, licensing, and registration of all chick-sexers.

The Council has already agreed to the principle of control, and a special committee has been instructed to proceed with the preparation of a scheme.

The same committee is also trying to evolve some method of identification which would prevent the perpetration of frauds in regard to the sex of chicks, for cases have been reported in which batches of so-called "mixed" chicks have turned out to consist almost entirely of cockerels.

The Editor acknowledges, with thanks, the receipt of the following:—

Report of meetings of the Midland Counties Division, Society of Veterinary Practitioners, and the V.M.A. of Ireland, from their respective Hon. Secretaries.

Communications from Mr. E. V. Kelly (Kells, Co. Meath), and Mr. H. C. Swann (King's Lynn).

Diseases of Animals Acts

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 31st August, 1935	10	15	—	—	3	3	13	60	40
Corresponding period in									
1934	17	28	3	361	4	4	31	41	28
1933	8	8	4	690	7	7	15	46	30
1932	5	6	—	—	3	3	18	27	13
Total 1st January to 31st August, 1935	243	285	34	10,208	84	169	227	1,314	778
Corresponding period in									
1934	264	301	5	454	98	160	409	1,079	675
1933	192	218	62	6,049	109	185	240	1,016	619
1932	251	309	6	562	99	159	164	1,207	598

NOTE.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.